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THE PRESENT STATUS OF MATERNAL AND INFANT HYGIENE IN THE UNITED STATES *

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NEARLY twenty years have gone by since the movement for the prevention of maternal and infant mortality was first undertaken as a definite and organized campaign by the American Public Health Association and kindred organizations. The American Association for the Study and Prevention of Infant Mortality was founded in 1909, and the Child Hygiene Section of our Association was established in 1921. The United States Children's Bureau was inaugurated in 1912. The pioneer efforts of such official agencies as the Division of Child Hygiene of the New York City Department of Health, about 1908, were supplemented from year to year by the addition of divisions of maternal and child hygiene in state and municipal departments of health, by the extension of public health nursing, the study and control of problems in the milk supply of our states and cities and by marked advances in the teaching and practice of pediatrics. Over the past 10 years, the outstanding contribution to maternal and infant hygiene has been the establishment of bureaus or divisions of child and maternal hygiene as an integral part of health department organization and practice. It seems timely, therefore, to find out in a broad and general way what the results of this branch of life conservation effort have been, especially for the past decade. It may be particularly instructive to outline the problem as its exists to-day. And perhaps it may be helpful to suggest certain newer lines of activity which should be undertaken in the immediate future.

I. FACTS ON THE MORTALITY OF WOMEN IN CHILDBIRTH

The recent data on the mortality of women from causes incidental to the childbearing state are highly interesting. Ten years ago, in 17 states and the District of Columbia, which comprised the Birth Registration Area of that year, there were 663 deaths from puerperal conditions for each 100,000 live births. More than two-fifths (42 per cent) of this mortality was due to puerperal septicemia, a condition known for many decades to be preventable. Considerably more than one-fourth (27 per cent) of the deaths were occasioned by puerperal convulsions. More than 9 per cent of this mortality of mothers occurred from accidents during labor, and a little more than 8 per cent of the deaths were ascribed to accidents during pregnancy.

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In other words, more than 85 per cent of the mortality in the puerperal state was due to these four causes.

What have been the changes in mortality during recent years for these more important complications of the puerperal state? The data available for the same 17 states and the District of Columbia, for each year of the period 1917 to 1924, show that while some progress has been made quite recently in the control of the infections incidental to maternity, and while a slightly greater decline was recorded for eclampsia, or convulsions, the reduction in the risk of death during maternity was slight and still leaves much to be desired.

PUERPERAL SEPSIS

What are the facts for puerperal sepsis? In the United States Birth Registration Area, over the eight years 1917 to 1924, there was a decline in the death rate for puerperal sepsis of only 1.4 per cent per year. The mortality figure for this complication of maternity was 276 per 100,000 live births in 1917 and 241 per 100,000 in 1924, a difference of only 35 deaths per 100,000 births. The grudging response in the death rate for puerperal sepsis becomes evident when we look at the rates of decline for certain of the other preventable causes of death. In recent years, the death rate from tuberculosis has been declining more than 4 per cent per year; that for diphtheria has declined 4 per cent per year ever since 1911 and typhoid fever mortality has been falling 8 per cent per year in the Death Registration Area of the United States.

There is little comfort in the recent figures on maternal mortality. While the puerperal sepsis death rate has not increased during the last 10 years, as some observers have been inclined to believe, the reduction actually observed is trifling when the preventable nature of this mortality is considered. The high rate of 241 deaths from sepsis, per 100,000 births, which occurred in 1924, challenges all right-minded persons who understand the preventability of that mortality. We are facing to-day, in our puerperal sepsis death rate, a problem of approximately the same magnitude as that which presented itself to this Association 10 years ago.

Considered according to the ages of mothers affected by sepsis, the figures are not particularly reassuring. The sepsis death rate in childbirth seems to have been reduced to a greater extent among young parturients under 20 years of age than at higher ages. For these younger women, the sepsis death rate declined 2.5 per cent per year. Below 20 years of age only 10 per cent of the births occur. Between the ages 20 to 29 years, where more than half of the births occur, the death rate declined only 1.4 per cent per year. It is the experience of this age group which colors the whole picture for mortality from puerperal sepsis. For women between 30 and 39 years of age, there was a slightly more favorable experience, the rate of decline having been about 1.8 per cent per year.

PUERPERAL ECLAMPSIA

The next most important hazard to the parturient woman is puerperal eclampsia, or convulsions. In 1924, there occurred in the Birth Registration Area 165 deaths from puerperal albuminuria and convulsions for each 100,000 live births. In 1917, the rate was 178 per 100,000 live births. This represents a decline of about 1.7 per cent per year, a figure slightly better than that for puerperal sepsis. Among young parturients, in the age division 10 to 19 years, the death rate for puerperal eclampsia declined about 4 per cent per year; for women in the age division 20 to 29 years, the decline was 2.7 per cent per year and for women in the next decade of life, 30 to 39 years, the rate declined less than 1 per cent per year. This record is slightly encouraging. The puerperal eclampsia rate is, in the first place, only two-thirds as

great as that for puerperal septicemia. Yet the improvement over the period 1917 to 1924 was slightly greater for eclampsia than for sepsis.

ACCIDENTS OF LABOR

The accidents of labor account for slightly more than 10 per cent of the prevailing mortality from conditions of the puerperal state. In years when influenza of the 1918 type was prevalent, the death rate for this condition was markedly increased. Omitting the year 1918, we find that over the period 1917 to 1924, the mortality from this condition declined about 2 per cent per year.

ACCIDENTS OF PREGNANCY

In recent years, the mortality record for accidents of pregnancy has been greatly disturbed by the prevalence of influenza. Normally, the rate is between 50 and 60 deaths per 100,000 births. So far as we have been able to determine, there has been no decided movement of the death rate from this condition in one direction or the other.

II. Facts on the Mortality of Infants

INFANT DEATH RATE IN TEN ORIGINAL DEATH REGISTRATION STATES, 1900–1926

The reduction of the infant mortality rate over the past quarter century is probably one of the outstanding achievements in the history of the life conservation movement. For the 10 original Death Registration States and the District of Columbia, the infant mortality rate in 1900 was 162 per 1,000 of the infant population. In 1926, the rate was approximately 80 deaths per 1,000 infants under one year of age. The reduction in infant mortality amounted to more than 50 per cent in the last 27 years. It should be recalled, however, that most of the improvement in infant mortality has taken place since about 1910. Comparing the years 1900 and 1910, the infant death rate in this particular area declined only 6 per cent, or an average rate of fall * of 0.6 per cent per year. Between 1910 and 1926, the rate declined 43 per cent, or 3.5 per cent per year. If we average the gains and losses, over the whole 27 year period, we find that the infant mortality rate declined on the average about 2.3 per cent per year.

The foregoing figures were necessarily based upon registered infant deaths and the estimated midyear population of infants for each year of the period 1900 to 1926. Related to births, the infant mortality data for the Birth Registration Area of 1917 are as follows:

INFANT DEATH RATE, 1918 TO 1925, IN U. S. BIRTH REGISTRATION AREA AS OF 1917

We found that the chief gains in infant mortality resulted from the experience of the past 15 years or so, particularly the last 10 years. Over the period 1918 to 1925, in the United States Birth Registration Area as of 1917, we found a decline in infant mortality between 4 and 5 per cent per year, a remarkable reduction in view of what had previously been accomplished between 1910 and 1918. These more recent figures also tell us that the infant death rate declined decidedly more rapidly in urban than in rural areas, and slightly more rapidly for female than for male infants.

DIFFERENTIAL DECLINE OF INFANT MORTALITY BY AGES UNDER ONE YEAR

The reduction in infant mortality must be considered, however, in its relation to the age of the infant. Most of the improvement in infant mortality, which has been observed in recent years, occurred in those age divisions of the first year of life, where the conditions affecting the infant's chances of survival were directly dependent upon the mother's knowledge of infant care, and upon the external sani-

* A trend line was fitted to the time series. The annual decrement of the trend line was divided by the average rate for the period trended. This gives the value "per cent fall per year."

tary and economic circumstances in the home. These higher standards of infant care and feeding have undoubtedly resulted from the effective campaigns which have been conducted by the public health movement during these recent years.

We find that beyond one month of age, there was a fall of 41 per cent between 1918 and 1925 in the infant death rate, or an average of 7.4 per cent per annum. It is in this age period where most of the saving of infant lives has taken place. Under one month of age, the death rate declined only 15 per cent between 1918 and 1925, or on the average about 1.8 per cent per year. Furthermore, most of the reduction of mortality in the first month of life occurred in the second, third and fourth weeks, where the decline was about 4 per cent per annum. Within the first week of life, excluding the first day, the reduction was only 1.3 per cent per year! And worst of all, the mortality of the first day of life has not decreased at all during the past ten years! The facts on the four causes of death which bulk largely in the early days of infant life are as follows:

The death rate from prematurity shows a decline of 0.8 per cent per year. There was, therefore, a fairly constant death rate from prematurity of about 19 per 1,000 infants over the period 1918 to 1925. In 1925, prematurity accounted for 24.1 per cent of the infant deaths under one year, for 36 per cent of the deaths in the first week, excluding the first day, and for 62.6 per cent of the deaths in the first day of life.

The death rate from congenital malformations declined about 0.6 per cent per year between 1918 and 1925. This comprised 16.2 per cent of the deaths in the first week, excluding the first day, and 9 per cent of the deaths on the first day.

INCREASED DEATH RATE FROM INJURIES AT BIRTH

The most startling fact, which was brought to my attention in this study, was the sharp *increase* in the death rate from injuries at birth during the past 10 years. Between 1918 and 1925, this death rate increased more than 5 per cent per year. Injuries at birth made up 14.5 per cent of the deaths on the first day of life in 1925, and for 16.7 per cent of the deaths in the first week, excluding the first day.

In 1918, the rate for injuries at birth was 360 per 100,000 infants, and the figure rose to 522 per 100,000 in 1924. In 1925, the rate was 518 per 100,000 births. The whole increase between 1918 and 1925 amounted to 44 per cent.

SYPHILIS AND EARLY INFANT MORTALITY

I need not tell you that it is impossible to determine from officially registered figures the true mortality of syphilis in early infant life. It seems hardly worth while to quote the available figures, because useful facts will not become available until more studies are made of the type carried on by Dr. J. Whitridge Williams of Johns Hopkins University Hospital. Dr. Williams's observations began in April, 1916, and were carried through the year 1919. They showed that 12 per cent of the early deaths of white babies in this study were due to syphilis, and that 45 per cent of the early deaths of negro infants were so caused.

Dr. Williams's convictions on the rôle which syphilis played in early infant mortality led him to make a concentrated and efficient effort to discover syphilis early in pregnancy, and to administer the indicated treatment. As a result of his efforts, it was possible to reduce materially the number of deaths from this cause. In as well controlled an experiment as Dr. Williams was able to make, it was found that only 7 per cent of the babies of syphilitic mothers died within the first 2 weeks, or were stillborn, when satisfactory anti-syphilitic treatment was given, as compared with a mortality of 52 per cent within the first 2 weeks where no anti-syphilitic treatment was given.

The results in the Johns Hopkins service are borne out by the facts available in the obstetrical services of Dr. Polak and Dr. Beck of the Long Island Medical College, Brooklyn, N. Y.

MATERNAL AND INFANT MORTALITY RECORD OF RECENT YEARS

What are the lessons which grow out of the recent experience in maternal and infant mortality?

How will the Child Hygiene Section of the American Public Health Association view the facts which have been brought out on the puerperal sepsis problem? What accounts for our failure to make definite progress against the infections of the puerperal state during the past decade? Ever since the work of Semmelweiss in Vienna in 1847, the modes of transmission of sepsis in childbirth have been fairly well understood. There are probably many who can recall the devastating effect of puerperal fever 30 and 40 years ago. At that time, there occurred from 400 to 800 deaths from puerperal sepsis in each 100,000 births in institutions. Substantial progress was made between 1880 and 1905, in reducing the more flagrant abuses in the handling of women in childbirth. But there is still a death rate which indicates the presence of grave hazards to the security of women at, and shortly after, delivery.

Literally hundreds of papers have been prepared during the past 20 years on the various aspects of the transmission and prevention of puerperal septicemia. Much effort has been expended in the endeavor to teach physicians and midwives the elementary principles of surgical asepsis which control the incidence of this condition. Yet relatively slight progress has been made in reducing this risk of suffering and death during the past 10 years in the states which constituted the Birth Registration Area in this country in 1917. How much of the educational effort *has been* translated into effective practice? How much of the effort *can* be translated into effective practice in the near future? How extensive in fact, is the gap between theory and practice in this field? Should this be determined by qualified and extensive investigation which measures up to the real size of the problem?

HOSPITALIZATION OF MATERNITY CASES AND THE SEPSIS DEATH RATE

In facing puerperal sepsis, the Child Hygiene Section ought to take account of the increasing tendency toward the hospitalization of confinements, and of the many serious questions which are raised, and which must be faced frankly, when women in labor are brought in close proximity to pus surgery in general hospitals. What are the hazards to women in such institutions? and where do they arise?—from the freedom of the medical and nursing staff to serve concurrently in the maternity and in other departments of the hospital? from the laundry, sterilizing and operating equipment? from fly and airborne infection? In the separate maternity hospital itself, what are the hazards from existing cases of puerperal infection? Are public health officials sufficiently aware of the hazards in the institutional care of parturient women?

HOME CARE OF MATERNITY CASES AND THE SEPSIS DEATH RATE

The experience with cases treated in the home should be ascertained and compared, on a sufficiently broad and representative basis, with the facts for institutional care. A comparison of experience for cases attended by midwives and physicians would also bring out facts of importance. Surprising results may follow from such an inquiry. The few fragments of experience available to us suggest that with noninterference in labor and with the observance of the maximum of cleanly technic which is possible in the average home, a lower percentage of infections occurs.

Some five years ago, Dr. Julius Levy[1] made a study of maternal mortality among cases attended in the home by midwives, and compared them with all the cases

attended in Newark, N. J., during the period 1916 to 1921. In cases handled by a midwife, there occurred 1.5 maternal deaths per 1,000 births, and for the whole city, including the midwife cases, the rate was 4.3 per 1,000 births. If the figures were available for cases not attended by midwives the rate would have been much higher than 4.3 per 1,000. It is interesting to inquire whether this favorable result was due to midwife attendance, or to the fact that the deliveries took place in the home, and presumably without undue meddling or tampering.

INSTRUMENTAL AND MANUAL INTERFERENCE WITH MATERNITY CASES

I cannot leave this subject of puerperal sepsis without reverting to the figures for fatal injuries to infants at birth, which suggest that there has been a tremendous increase in instrumental interference with the birth process, and perhaps in manual interference, during the past 10 years. These figures showed an increase of 5 per cent per year in the death rate for injuries at birth. One former state commissioner of health told me that if he could prevent attendants at birth making digital examinations, from meddling with the due process of delivery, the death rate from maternal sepsis in his state would be cut in two! Unnecessary interference with the normal course of delivery may account for a heavy proportion of the infections which occur among parturient women.

INSTRUCTION OF BIRTH ATTENDANTS IN OBSTETRICS

The question of obstetrical instruction in our medical colleges has been raised in connection with the recent tendency in puerperal sepsis mortality. Has the crowded condition of the curriculum of the modern school of medicine interfered with the thoroughness of instruction in the care of the parturient women? Is there sufficient emphasis upon the need for patience in the management of labor? Has the medical student been taught the usefulness of supervision during the prenatal state? Are the requirements of rigid asepsis sufficiently stressed? So far as the actual conditions of family medical practice are concerned, Dr. Levy has pointed out that the physician working alone under trying conditions, with a busy but poorly paying practice, may neglect his technic and adopt procedures which save time, but deal death.

The decline in mortality from puerperal eclampsia was slightly more favorable than that for puerperal sepsis. It is more than probable that the slightly encouraging record reflects the efforts of state and municipal bureaus of child hygiene, of nursing organizations doing prenatal work, and of the medical profession during recent years when more and more pregnant women have been brought under observation and advice. I think it may be fairly stated as a demonstrated fact that the medical and nursing supervision of women during pregnancy, the discovery of conditions which suggest toxemia, and the treatment of these conditions well before the lying-in period have resulted in material reduction of the risk of convulsions during or after confinement.

The experience of the Maternity Center Association of New York City throws some light upon the effect of prenatal care in reducing puerperal eclampsias. The care given 8,743 patients during a 27-month period closing August 15, 1921, brought substantial results. The mortality from eclampsia among these mothers was about one-third that of the general population of New York City in the corresponding period of time. Some 95 per cent of the cases showing albuminuria during pregnancy resulted in full term delivery. There occurred among the infants in this series only 5 deaths from prematurity in the first month of life per 1,000 births, as compared with a figure of 15 per 1,000 for New York City as a whole.

In respect to puerperal eclampsia, the problem of the future seems to be the further extension of facilities for bring-

ing more pregnant women under observation, so that conditions suggesting toxemia may be treated and the eclampsia averted. The work of the state and municipal agencies, of hospitals and public health nursing organizations should be assayed, because no facts are available for any broad area at the present time on the variety, extent and effectiveness of this type of important preventive work. The determination of syphilis in the pregnant woman, and the adequate treatment of this condition, could be allied with the efforts made during pregnancy to discover and treat potential eclampsias.

It is an open question how much of the mortality from accidents of labor is preventable. Would it be possible to reduce the death toll from accidents during labor by bringing more cases under the supervision of the physicians early in pregnancy, in order that structural abnormalities in the patient may be recognized and suitable arrangements made for meeting the trying and dangerous situations which sometimes arise during labor? Undoubtedly, lack of preparation for confinement emergencies leads to unnecessary mortality. Real results may follow when qualified obstetrical service is made available to physically handicapped women. Some effort should be made to determine the facts on this point.

You will recall that the death rate for accidents of pregnancy showed no material improvement in recent years. Possibly, the control of accidents of pregnancy has been outside the range of agencies now working in the field. A significant proportion of spontaneous abortions and miscarriages is subject to control, especially in the second and subsequent pregnancies, where the physician may be guided by his experience with the first pregnancy. Unfortunately, too much of the accident mortality in pregnancy arises from induced abortions, the extent of the practice being unknown at the present time.

In the field of infant mortality I believe we are facing a slower rate of decline in the death rate over the next decade than we have experienced in the past. This follows because a low point has already been reached for the age division beyond one month and because of the stationary condition of the high rate in the first four weeks of infant life. In 1925, beyond one month of age, the rate was 39.2 per 1,000 infants. If the present rate of decline continues the rate will be about 18 per 1,000 in the year 1935.

For mortality under one month, the rate was 507 per 1,000 infants in 1925, and the future trend of the death rate, based upon tendencies of the past 10 years, will bring us a rate of only 426 per 1,000 in the year 1935.

That the margin of saving in infant mortality is slight at the present time is shown by the fact that among 187 of our cities in 1926, there were only 24 of them with rates above 100 per 1,000. Ten years ago, 107 of these 187 cities had rates in excess of 100 infant deaths per 1,000 births. It is the concentration of effort upon the causes of infant mortality beyond one month of age which brought about this reduction of the number of our cities with excessive infant death rates. Further effort by our state and municipal departments of health along established lines will no doubt eliminate from the record the few cities whose infant mortality rates still exceed 100 per 1,000. This will be brought about largely through the reduction in these areas of the mortality in the later age intervals of infant life. Possibly, a general average infant mortality rate of 50 per 1,000 for the whole of the first year of life is in prospect for the Birth Registration Area within 10 years.

NEWER PROBLEM OF EARLY INFANT MORTALITY

This Association and its Section on Child Hygiene are facing, however, the new and baffling problem of preventing the death, annually, of about 100,000 infants *under* one month of age in this

country. I believe we ought also to consider the annual toll of 100,000 stillbirths. These foetal deaths are in essential respect as worthy of consideration as are the deaths of liveborn children in the early days of life. The same general factors seem to be involved in the causation of stillbirths as are met with in the production of the heavy and undiminished death toll among young infants. Possibly, the same program which will prevent deaths in the first month of life will be effective also in preventing stillbirths. The outlook for reducing materially this annual budget of 200,000 deaths should be seriously considered by this Section. There is no field of public health work which so much deserves immediate and concentrated inquiry and effort.

May we expect that some impress will be made upon early infant mortality when the possibilities of better maternal care during pregnancy and at delivery are studied further by public health workers and the medical and nursing profession? I think so. No one believes that these deaths are "inevitable"; at least, I have not seen in this country any tendency to view these deaths as nature's failures. Man is not powerless to prevent a large part of the annual loss of 100,000 of these lives of very young infants. Effective work has been done to control syphilis, and the toxemias of pregnancy, two major maternal conditions which kill very young babies. The very fact that these "early infant" death rates vary so widely from place to place suggests that causative factors are not constantly present to produce a "natural" or "irreducible" death rate. American public health workers do not see "eye-to-eye" with some of their British brethren who regard the great bulk of these deaths in early infancy as "natural selection in operation, steadily eliminating the unfit."[2] This attitude cannot be assumed until satisfactory answers are made to the questions which are put to us by the figures on maternal and infant mortality in recent years.

A stationary death rate from prematurity, about 20 per 1,000 infants for the whole of the first year of life, will not be considered "irreducible," until we are convinced that the syphilis which causes so many miscarriages in the third trimester of pregnancy is beyond recognition and treatment earlier in pregnancy: six months in which to detect and treat the commonest cause of miscarriages and of premature births.[3] Then, too, the prematurities which result from eclampsia in the mother are not to be viewed as constant, irreducible elements in infant mortality. The plain facts are that doctors *can* detect toxemia in pregnant women, they *can* control the condition and they *can* avert the tragic consequences to mother and child if cases are brought to them soon enough. What would happen to the stationary death rate in the first day of life if we put into effect what is already known about the control of syphilis and toxemia in pregnant women? In 10 years shall we still say that more than three-fifths of these "first-day" deaths are due to prematurity? Is it part of a fore-ordained scheme of things that the death rate from injuries at birth has increased at a rate of more than 5 per cent per year since 1918? Are we satisfied with the fact that 15 per cent of the deaths in the first day of life are due to birth injuries? Is this rising death rate an index of the increased use of instrumental means for hastening delivery? Has there been a change in the attitude of physicians toward the management of labor? Does the death rate reflect undue meddling or tampering with nature's process for bringing new lives into the world? Is a rise in the death rate from 360 to 518 birth injuries per 100,000 infants, between 1918 and 1925, too great a price to pay? Is this cause of infant death preventable?

The figures on recent maternal and infant mortality are a challenge to this Section. What are we willing and able to do? How can we enlist the interest

of physicians, especially obstetricians, the hospitals, the nursing profession and the general public in the 17,000 families deprived of wives and mothers each year? in the 100,000 liveborn babies whose lives are snuffed out within a few weeks by causes largely preventable, and in the 100,000 children stillborn, who may have a chance for life and productive service if we have the vision, the initiative and the skill to effect needed reforms in the care of mothers and very young children?

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DISCUSSION

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THE FACTS presented by Dr. Frankel as to maternal and infant mortality confirm those which have been presented in recent discussions by practitioners and teachers of obstetrics and pediatrics of large experience and recognized authority. As one who has been interested for many years in the teaching of medical students and, now, in the medical and health education of the public, I am glad of the opportunity to comment on certain phases of the subject, especially the question raised by Dr. Frankel—What is to be done to solve the problem of further improvement in infant and maternal mortality?

Eager as we are to bring about further improvement, it may not be improper to reflect on the amazing improvement which has taken place in the last half century. It is not so long ago since in almost all nations maternal and infant welfare was held in little regard. Women were treated in large part as slaves; infants were sacrificed in time of famine, as a religious rite, for cannibalistic purposes and for other reasons. Such practices even to-day obtain in some countries that are regarded as civilized.

While the insistence by Dr. Oliver Wendell Holmes and Semmelweis that puerperal fever is a contagious disease was enunciated 80 years ago, it was a long time thereafter before the truth was generally accepted by the medical profession. I recall that as recently as the 80's of the last century a heated discussion was waged in the New York Academy of Medicine by the late Dr. Fordyce Barker, then the leading obstetrical practitioner of New York City, and T. Gaillard Thomas, a leader in gynecology. Dr. Barker maintained stoutly that puerperal fever was not a disease of extraneous origin.

The conditions which obtained in some of the leading hospitals of the world much less than a century ago, when as high as 70 to 80 per cent of women confined within their walls died of puerperal sepsis, are appalling to contemplate. The advance from that state of affairs to the point where only six-tenths of one per cent of women in the whole nation die from puerperal complications is a long stride indeed. That we have not yet, however, reached the irreducible minimum is evidenced, as Dr. Frankel has pointed out, by the wide discrepancy between the experience of some practitioners and hospitals as contrasted with that of others. When a lying-in hospital can report more than a thousand consecutive births without a single case of puerperal sepsis it is proof-positive that there must be something at fault in the experience of other institutions where the mortality rate is so much higher.

When a practitioner in a little town in Nebraska can report 717 cases of pregnancy, in 506 of which the foetus reached the stage of viability, with only two maternal deaths in the whole series, it is evident that the technic of many other practitioners could be much improved.

It would be a comfort indeed, in this effort to improve still further the maternal and infant mortality rates, if we could hit upon some scheme, by legislation or otherwise, which would be immediately effective. There appears, however, to be no plan other than that of the continued search for new knowledge on the one hand, and the wide dissemination of information

on the other, as certain means of improving the situation.

The sterilization of the unfit carries too meager possibilities to be deserving of consideration. It was hoped that the requirement of a certificate of freedom from venereal disease as a prerequisite to marriage, which has been tried in at least one state, would diminish the bad results which follow the marriage of syphilitics. But even though this custom were to be adopted widely, it is doubtful if it would have any appreciable influence on the general situation.

GREATER DISSEMINATION OF KNOWLEDGE

The great advance which has already been made is the result of two things: First, the contributions to our knowledge of maternal and infant conditions which have been made by physicians, especially within the last half century or slightly more. There is every reason to hope that continued investigation will find the solution of some of the problems still undetermined, such as that of puerperal eclampsia. It is important, therefore, that the quest for new knowledge should continue with full encouragement and support, especially in the institutions of higher learning and in hospitals of the right sort. In so far as possible, this research should be conducted in institutions where medical instruction is being carried on at the same time. One grows impatient over the ever recurring demand that the education of medical students should be made more practical, that research has no place in the college halls, laboratories and hospitals devoted to the preparation of men for the general practice of medicine. The fact is that the methods of observation and of thought which should be inculcated in the student who is to practice medicine are exactly of the same type as those which are essential for the most intensive research worker.

Second, the knowledge already gained and that which we may hope is to be added to our existing store, must be widely disseminated and put to practical use in the obstetric and pediatric work of the general practitioner. This applies especially to the students in the medical schools, who are fitting themselves to be the practitioners of the coming generation. The institutions in which this education is being conducted, the medical schools, even the best of them have been slow to realize the fact that the medical practice of the near future is to be much more largely in the preventive field than it is at present. That school which is not preparing its students to appreciate keenly and to understand the possibilities and methods of preventive medicine is not fitting them for the demands which are already being made on the medical profession.

To the credit of the teachers of pediatrics be it said that they have been among the first to recognize this fact. The rapid development of infant welfare stations or postnatal clinics in connection with the medical schools has been one of the gratifying advances of the last decade and a half. In obstetrics the difficulty has been, and still is, the lack of clinical opportunities to give students proper preparation for the practice of this important branch of medicine. While a student in the two medical schools from which I graduated, I never examined a pregnant woman nor attended a case of delivery. This was true of the vast majority of students for many years after the date of my own graduation. When one considers the utterly inadequate training of most of our medical students in this branch up to within a few years ago, and even today in many medical schools, he marvels that the maternal mortality rate has been lowered as much as it has been.

The doctor now in practice is seeking to amend his deficiencies in knowledge of obstetrics, as well as of pediatrics, in a variety of ways. I do not think that the post-graduate and polyclinic schools in our large cities have been a factor of much moment. They have been, for the most part, devoted to the training of physicians who desired to fit themselves for the more or less exclusive practice of some more attractive specialty, such as laryngology, otology, ophthalmology, surgery, gynecology, and the like. Nor does it seem to me likely that the metropolitan post-graduate or polyclinic school is destined to be a very large factor in the improvement of this situation. There are, however, great possibilities in the organization of hospitals of moderate size located in cities where there are no undergraduate medical schools, if they can be made to function as teaching and study centers for the general practitioner. Wherever a hospital has even a few obstetric and pediatric patients, with competent and well-trained physicians in charge of these beds, it offers opportunity for the training of one or more practitioners in that vicinity who may come for short courses or, better yet, may serve as interns in these wards for periods of from 3 to 6 months. Post-graduate lecture and demonstration courses, such as have been arranged for by many of

the local medical societies, are an important factor.

STATE BOARDS OF HEALTH FUNCTIONING

The maternal and infant welfare departments of some state boards of health are providing courses of instruction along these lines. In one of our mid-western states such a course is now being conducted by an obstetric teacher who is giving lectures and demonstration courses to physicians in 6 convenient centers in different parts of the state. A report from the director of this division states that the demonstrator has talked recently in one city to 50 doctors and in the others from 11 to 29. She writes, "The interest and attention shown by the doctors is certainly commendable. Numerous questions were asked and many cases reported. The particular thing that pleases me most is that the majority of these doctors are men from little towns surrounding the cities visited. Several of these men came as far as 80 miles to attend this lecture." One of the obstetricians of the state has contributed a manikin, making possible a type of demonstration which many of these physicians have probably never had opportunity to witness before.

I know of no more useful line of activity in which a state board of health can engage than in this provision for post-graduate instruction in obstetrics of the practitioners of the state.

EDUCATING THE MOTHER

It is not alone sufficient, however, to educate the medical profession to the practice of better obstetrics and pediatrics. It is true, especially of pediatrics, that the education of mothers is the one main reliance in lessening infant mortality. The sterilization of milk, by boiling or pasteurization, the distribution of clean milk from milk stations, the maintenance of summer tent colonies, floating hospitals and the like, the supplying of milk formulae of various sorts were all helpful, in a small degree, in lowering infant mortality, but it was not until Budin demonstrated that the mother is the *crux* of the whole situation and that in the training of the mother in the proper care of her babe lies the one dependable method of conserving its life, that the remarkable decline in the infant mortality rate became possible.

Recently, a method of instructing the public in these, as well as in other lines of health betterment, has arisen in the form of health demonstrations which, supported by benevolent foundations, have been conducted on a considerable scale in about 10 typical centers, ranging from the large city district to the rural community. They have been potent agencies in the communities where they were situated, demonstrating to the people the great importance of preventive medicine. It appears, from reports, that some mistakes have been made that might naturally be expected in these first trials of the plan. It may not be out of place to allude to some of these. A report of the Cattaraugus County Medical Society in New York where such a demonstration was conducted, has been published. It states that in some respects the demonstration did not meet with the approval, or secure the results which were advantageous, in the opinion of the majority of practitioners in that community. It is asserted that it tended to destroy the confidence of the community in the local profession; that it was conducted on such a scale of cost as would make it impossible, under present conditions, to secure its continuation by public funds through taxation; that it has tended to educate the people to the desire for free medical service.

Similar reports have come from two other demonstrations of like sort and from one of these, signed by 16 physicians, I venture to quote: "The object supposed to have been kept before the demonstration workers was that they do their utmost to preserve in the patients' minds respect for their family physicians. They did not always succeed in doing this, partly through their being carried away at times by enthusiasm for demonstration work, during which the physician was lost sight of, partly through their emphasizing the idea that the demonstration was being carried on by men ranking as specialists in pediatrics, thus giving the patients the idea that they could get better service than their family physician could give them, and, finally, partly because the family physicians in many cases resented these activities as impertinent interferences and meddlings in the private relations which should exist between the physician and the patient. The result was that the demonstration employe soon neglected almost entirely to make any effort at keeping up any contact or liaison between patient and physician and the inevitable result finally was that patients did tend to lose respect for the family physician and looked entirely to the demonstration for examination, advice and treatment. The obvious result of the demonstration was that not only the indigent but the well-to-do also went to the clinic for examination, advice and treatment because they have

come to look upon it as a place where they could secure the expert service of specialists free of charge and with a natural end-result that all were pauperized to that extent and not ashamed of the fact."

This is the statement of a group of physicians of a fine type actuated, I believe, by thoroughly unselfish motives.

Reports from some of the more recent demonstrations give testimony to the better judgment and wisdom with which they are being conducted. They seem so far to meet with the approval of the medical profession in the communities where they have been instituted.

Would not most of us agree, that a health demonstration which leaves a community where it has been conducted with a lessened regard for its own physicians is, to that extent, a failure? The fault may lie as much with the physicians as with those who conduct the demonstration, but wherever the fault lies, the result, in so far as those features are concerned, is not one to be desired. When such a demonstration is entered upon it should be organized and conducted by persons with broad vision who can see the future as well as the immediate effects which may result from the methods adopted.

If it is planned that the demonstration, or its equivalent, shall be continued permanently with a view of supplying by this means all or part of the medical service needed for the community, that is one thing; if, on the other hand, it is expected that when the demonstration is withdrawn people of the community are to pursue the plan of consulting their own family doctors and health advisers, then it should seek to preserve and increase the confidence of the community in its local medical profession. If they are not worthy of that confidence, then, it seems to me, the remedy lies in their instruction and improvement.

It is very certain that the vast majority of the medical profession believe that the substitution for the family doctor of clinics of this sort is not to be desired and if it were to become a general custom, the profession of medicine would cease to attract many of the young men who now enter it. They decide upon medicine instead of other professions, the preparation for which is much less time-consuming and expensive, because of the unusual opportunities it offers for a combination of scientific work of the highest order with a practical application of the most attractive and useful type.

I talked a few days ago with a professor of the Russian language in one of our leading universities who has visited Russia a number of times and as recently as a year ago. I had read that the situation in Russia in reference to the distribution of physicians was even worse than in our own country, that there were 4,000 physicians in Moscow with little to do and vast districts of people with utterly inadequate medical service. He confirmed this, saying that in one district in which he spent a month, there were 45,000 people with only one physician! I had read further that while there were 10,000 students of engineering in Russia, there were only 4,000 students in medicine, half of which were women. This he believes to be true.

Previous to the World War, Russia was one of the leaders in medical science and medical education in all the world. It is believed that the example of Russia, in which young men are not being attracted to the profession of medicine because of conditions under which they are forced to practice is worthy of some thought in connection with what steps we may take in this country in the direction of modifying conditions of medical practice.

To summarize briefly: Further improvement in maternal and infant welfare and infant and maternal mortality is to be secured by the same methods that have already obtained such wonderful results, namely, continued research for new knowledge along these lines, especially in the university medical schools and hospitals; better and more continued education of both under-graduate student and practicing physician, emphasis to both of these groups on the idea that they are to find a large field of usefulness in preventive medicine in which their principal function will be that of teachers of the public through the medium of the newspapers, magazines, through health talks and addresses, and, above all, through that most effective of all methods of instruction, the face to face talks in the home and the doctor's office.

THE RELATION OF PARATYPHOID BACILLI TO FOOD POISONING *

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PARATYPHOID bacilli are associated with a train of symptoms of a kind popularly deemed to be highly characteristic of food poisoning: nausea, abdominal pains and diarrhea, following a few hours after the meal at which the incriminated food was eaten. These bacilli were the first, as they are still perhaps the best known, to have their specific relationship to food poisoning clearly demonstrated. There remain, however, as will appear, unsolved problems connected with the part they play in the production of human illness.

One of the earliest sources of difficulty was the confusion that long existed with respect to the different species or varieties. Paratyphoid bacilli, or as some writers prefer to call them, bacilli of the Salmonella group, are now known to comprise a number of organisms more or less culturally and immunologically distinct and of diverse epidemiological significance. *Bergey's Manual* lists 19 "species" under the genus Salmonella and Ford describes 17 bacteria of "the paratyphoid group." Both authors, however, designate by different names organisms that are certainly identical. The nomenclature of the group is in need of thorough revision.

At least one distinction of great practical importance is now generally recognized. Certain of the paratyphoid bacilli—notably the types known as *B. paratyphosus A*, also called simply *B. paratyphosus*, and *B. paratyphosus B* of the Schottmüller type, or simply *B. schottmülleri*—are primarily bacilli of human infections and pass from an infected human being to a healthy one in precisely the same way that *B. typhosus* does. *B. paratyphosus* indeed appears strictly limited to the human host, never having been found, so far as I am aware, in infections of the domestic animals or in house vermin. *B. schottmülleri* also can commonly be traced to an infected human being, but seems occasionally to be found in swine; no epidemiological connection of *B. schottmülleri* of porcine origin with human disease, however, has ever been demonstrated.

Other known paratyphoid bacilli appear to be parasites of various mammals and birds, and, in some instances, as in the organism of contagious abortion in mares, are quite definitely specialized to a particular host. Others, such as *B. enteritidis*, are more cosmopolitan; this organism has been found in spontaneous laboratory outbreaks among guinea pigs, mice and white rats and also in diseased swine and in cattle.

CONFUSION IN NOMENCLATURE

Part of the confusion with respect to the identification and classification of the members of this group has been due to mistakes in nomenclature, part to the assumption that the nature of the organism could be determined by its origin—*e.g.*, that all cultures from mice were of the "typhi murium" variety—and part to inadequate differential methods. Names given to individual members of the group

* Read before the Joint Session of the Laboratory and Food and Drugs Sections at the Fifty-sixth Annual Meeting of the American Public Health Association at Cincinnati, O., October 17, 1927.

have been loosely applied to the whole group; the terms Gärtner bacilli and hog cholera bacilli have been sometimes used in one sense, sometimes in another, so that it may be impossible, for instance, if an investigator has reported finding "Gärtner bacilli" in a food poisoning case, to know whether he really found *B. enteritidis* or simply some organism with the general paratyphoid bacillus characteristics. It does not follow, moreover, that the isolation of a paratyphoid bacillus from diseased swine or from pork that has caused food poisoning is *prima facie* evidence that the bacillus is of the type known as the "hog cholera" bacillus; at least four distinct varieties of paratyphoid bacilli have been isolated from swine. These two sources of error were difficult to control until adequate methods of differentiation were developed.

In Germany *B. suipestifer* and *B. schottmülleri* were for a long time believed to be identical and this belief resulted in considerable confusion as to the relation between human and animal infections. In England several observers recognized that some difference existed between the human paratyphoid bacilli and what they called *B. suipestifer*, but wrongly identified *B. suipestifer* with *B. aertrycke*, the common food poisoning bacillus of this group. Thanks to the work of Schütze, Savage and White in England, and of Krumwiede, Koser and others in this country, much more is now known about the various members of the group and their relations to one another and to the epidemiology of food poisoning.

CLASSIFICATION

The general picture is now quite clear. Two species, *B. paratyphosus* and *B. schottmülleri*, are primarily human parasites, and no infection with these organisms has yet been traced to a preëxisting infection in the lower animals. Among the remaining species, the "animal paratyphoids," several different kinds have been shown by fairly conclusive evidence to be the occasional cause of outbreaks of food poisoning; others are under suspicion.

1. *B. enteritidis*—This organism was the first to be definitely connected with an outbreak of food poisoning. It was discovered by Gärtner in 1888 in a meat poisoning epidemic in Germany and the evidence brought forward as to its causal relation was quite convincing. Since that time this bacillus has been reported in a number of similar outbreaks in various parts of the world. While it is necessary to discount reported findings of *Gärtner bacilli* that lack further description of the organisms, there are on record a considerable number of outbreaks due to fully identified strains of *B. enteritidis*. In my collection of well authenticated food poisoning bacteria there are three strains of this organism.

More needs to be known about the previous sources of infection with *B. enteritidis*. There is some reason, however, for connecting this organism with bovine infections; the original strain isolated by Gärtner was derived from a cow ailing before slaughter, and in other outbreaks beef, veal and milk seem to have been rather commonly implicated. There are other possible sources. Savage and Forbes[1] attribute an outbreak in England to contamination of food by a food handler, but the evidence on which they rely is not conclusive. Another and more probable source is contamination of food by rodents. *B. enteritidis* has been found in spontaneous outbreaks among rats and mice, both in the laboratory and under natural conditions. The original Danysz strain was probably of this type. Most of the commercial rat viruses appear to contain this organism, and a number of human infections with rat viruses have been reported. The question of food contamination by rodents is of practical importance and I shall return to it presently.

2. *B. suipestifer*—This organism, formerly believed to be the cause of hog cholera, seems to be a pretty definitely specialized parasite of the pig, where it

is found, perhaps as an accessory invader, in various diseased conditions. I have never met with this organism among strains from rodent or bovine sources, but apparently it may rarely affect animals other than swine. A bacillus isolated from the mesenteric gland of a monkey was sent me from the Lister Institute and has proved to be typical of this species. Human food poisoning due to *B. suipestifer* has occurred, but seems to be relatively rare. The channels by which *B. suipestifer* finds its way into incriminated food seem to have remained undiscovered, although pig meat has been usually suspected. It is remarkable that despite the frequent occurrence of hog cholera, in which this organism is usually present, there are no reported instances of farm outbreaks of human food poisoning associated with outbreaks of the porcine disease.

3. *B. aertrycke*—This seems to be preeminently the organism of food poisoning. By far the larger number of paratyphoid cultures isolated from typical food poisoning outbreaks and completely identified by modern methods belong to this type. Ten of the food poisoning strains in my collection are of this species, and Savage and White in their study of 100 recent outbreaks of food poisoning in Great Britain record a similarly high proportion of *B. aertrycke*. This species closely resembles *B. schottmülleri* in both its cultural and agglutinative characters, but can now be separated from it by cultural tests as well as by the time-consuming method of agglutinin absorption. Much of the difficulty experienced in establishing the true etiology of food poisoning has been due to failure to distinguish *B. aertrycke* from *B. schottmülleri* and *B. suipestifer*. It is probable, for example, that most of the food poisoning outbreaks at one time ascribed by British authors to *B. suipestifer* were really due to *B. aertrycke*, although most of the descriptions do not permit complete identification and the original cultures have long since disappeared. The loose use of the name *B. suipestifer* has misled some writers, as apparently it has recently Damon and Leiter,[2] into supposing that *B. suipestifer* is "not infrequently the etiological agent" in food poisoning epidemics; Gill, however, to whom these writers refer, expressly uses the designation "*Bacillus suipestifer (aertrycke)*." The authenticated food poisoning strains that I have received from British sources with either the label "B. suipestifer" or "mutton type" are all *B. aertrycke*.

Like *B. enteritidis*, *B. aertrycke* appears to be sometimes present in food as a contamination from ailing animals. It occurs in diseases of cattle and calves although, so far as can be judged from the meager evidence, not so commonly as *B. enteritidis*. It has been found in several extensive epidemics of sheep, and meat from those animals, when used for human food, has caused illness. The famous "mutton strain" of the Lister Institute is the prototype of this group. *B. aertrycke* does not seem to have been found in swine. Different species of rodents, such as guinea pigs, rabbits and mice are occasionally infected with *B. aertrycke*.

The history of the outbreaks of food poisoning in which *B. aertrycke* has been found often fails to present satisfactory information as to the source of the specific contamination. In the instances reported by Savage and White, such diverse articles as milk, canned tomatoes, beef brawn, cockles and canned apricots were suspected as the vehicles of infection. The frequency with which food substances of other than animal origin are concerned lends countenance to the belief that contamination of food by rats and mice may be an important factor. Contamination by human carriers of *B. aertrycke* is a possibility, but remains to be proved.

Whether other "animal paratyphoids" may give rise to food poisoning is not known. A number of outbreaks due to the consumption of horse meat have been

reported in European countries, but in no instance does it seem to have been determined that the equine paratyphoid strain *(B. abortivo-equinus)* was the causal organism. A similar uncertainty exists with respect to the share of the avian paratyphoid strains, *B. sanguinarium* and *B. pullorum*, in causing food poisoning. As yet no evidence of causal connection has been brought forward.

There seems little doubt that the animal paratyphoids causing food poisoning sometimes pass from the alimentary tract into the tissues and cause a true infection. This is true at least of *B. enteritidis* and *B. aertrycke*, both of which have been found not uncommonly in necropsies. It is not clear, however, how far the physiological phenomena of food poisoning are to be charged to the growth of living bacilli in the body and how far to the action of formed poisons. It has been shown by a number of investigators that certain paratyphoid bacilli produce a poisonous substance, and that the filtrates of even young cultures are toxic. Animal experiments with the poisonous filtrates have been difficult to interpret since the culture filtrates are toxic for rabbits and mice when injected intravenously, but have no apparent effect when given by other routes. Miss Branham of the University of Chicago has shown that the Berkefeld filtrates of 6-to-13-days-old *B. enteritidis* cultures in a synthetic medium of ammonium succinate, dipotassium phosphate and sodium chloride are extremely toxic for rabbits. These filtrates give at most a very faintly positive protein reaction. They have definite antigenic properties and stimulate in rabbits the production of agglutinins, precipitins, complement-fixing antibodies and possibly antitoxins. The toxic cultures and filtrates of paratyphoid bacilli are thermostabile, and withstand boiling and even autoclaving without loss of toxic power.

INTOXICATION OR INFECTION?

The short period elapsing in certain paratyphoid food poisoning outbreaks between the ingestion of the food and the appearance of symptoms has lent color to the belief that poisons already formed in the food or arising from the disintegrated bacterial cells were the cause of illness rather than the growth of the bacilli in the human body. The transient character of the symptoms is in accord with this belief. Some outbreaks give evidence both of immediate toxic action and of infection. Savage and White have attributed a number of food poisoning outbreaks occurring in Great Britain to the action of thermostabile paratyphoid toxins present in foods preserved by heat. The specific epidemiological and laboratory evidence presented by these writers is, however, of varying degrees of cogency.

As matters stand, there is ground for believing that pre-formed thermostabile toxic substances produced by certain paratyphoid bacilli play a part in the causation of food poisoning. Just how important this is as compared with the part played by living bacilli remains to be determined. The epidemiological resemblance between this type of food poisoning and Asiatic cholera in which there occurs a rapid multiplication and subsequent disintegration of the specific microörganisms in the alimentary tract may perhaps be significant.

PREVENTION OF PARATYPHOID FOOD POISONING

Prevention of paratyphoid food poisoning may be effected in various ways. The two human types of paratyphoid fever, which in some of their manifestations are closely related to food poisoning, can probably be best combated by avoiding contact with the sick, by guarding food supplies, especially milk, against contamination by carriers or convalescents, and by eliminating polluted drinking water. In a word, the measures found effective against typhoid infection are likely to reduce the human paratyphoid infections in equivalent degree. Protective inoculation against the two paratyphoid fevers has

been largely practiced in recent years in the use of the so-called triple vaccine, but I am not aware of any valid statistical evidence that their prevalence has been lessened by this procedure.

Food poisoning due to infection with the several paratyphoid bacilli of animal origin or to intoxication with their products may undoubtedly be prevented to some extent by making sure that only healthy animals are used for food. The recognition that the bodies of animals dying a natural death are not altogether fit for food is very ancient. The twenty-first verse of the fourteenth chapter of Deuteronomy reads: "Ye shall not eat of anything that dieth of itself: thou mayest give it unto the sojourner that is within thy gates that he may eat it; or thou mayest sell it unto a foreigner." There is general agreement at the present day that milk or meat from ailing animals should not be allowed to come on the market, and so far as it is possible to prevent the consumption of food so derived, in so far will outbreaks of food poisoning be diminished. It is plain that this can best be achieved, not by inspection of the foodstuff, but by careful examination of the living food animals.

COOKING FOOD A SAFEGUARD

It seems to be true also that the thorough cooking of food just before serving is in some degree a safeguard. In numerous outbreaks, an article of food raw or partly cooked has given rise to illness, while the same article consumed after cooking has had no bad effect. In view of the heat-stability of the poisonous substances present in paratyphoid bacilli, the apparent protection conferred by cooking is worthy of further epidemiological inquiry.

The possibility of food contamination by rats and mice has already been mentioned. The use of commercial rat viruses containing members of the paratyphoid group—generally *B. enteritidis*—constitutes a hazard to public health and should be prohibited. Not only is there already on record a formidable list of outbreaks, some of them attended by fatalities, due to direct human infection with these viruses, but animal carriers may be produced, leading to a wide dispersion of a dangerous pathogen.

Apparently vermin that have never been exposed to rat viruses may also carry these organisms. That wild rats in the United States do actually harbor paratyphoid bacilli has been shown by the observations of Miss Verder in Chicago in 1925 and more recently and more extensively by Meyer and his associates in San Francisco. Anyone examining the published reports of outbreaks of food poisoning must be impressed by the considerable number of instances in which it has been impossible to trace any connection with a food-handler or an infected food animal and in which contamination by house vermin seems to have been possible and in some cases highly probable. It is likely that this source of paratyphoid food poisoning has been somewhat overlooked or underestimated and that eventually a considerable proportion of the outbreaks of this nature will be found due to the contamination of food by rats or mice.

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SCHOOL VENTILATION. ITS EFFECT ON THE HEALTH OF THE PUPIL *

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SINCE the 1926 convention of the American Public Health Association, the committee has met but once, February 24, 1927, in New York City. This meeting was called for the purpose of considering various angles of the proposed comparative study of the effects of different types of ventilation on the health of school pupils in selected schools in Rochester, N. Y.

It will be recalled that early in 1926, the American Public Health Association, and the American Society of Heating and Ventilating Engineers were invited by the Fresh Air Indoors Committee of the Tuberculosis and Public Health Association of Rochester, N. Y., to collaborate with them in conducting this study in schools to be indicated by the board of education, and altered at the board's expense to conform to the highest standards of window-gravity ventilation on the one hand, and mechanical ventilation on the other.

In order that standards for interpreting the results of studies of this type might be established a National Central Conference Committee on School Ventilation was organized at a joint meeting of the Committees of the American Public Health Association and the American Society of Heating and Ventilating Engineers held in New York City, May 10, 1926. This Conference Committee was composed of representatives of the following organizations:

American Society of Heating and Ventilating Engineers	3 members
New York Commission on Ventilation	2 members
American Public Health Association	1 member
Joint Committee on Health Problems in Education, American Medical Association and National Education Association	1 member

This group met June 21, 1926, for the purpose of organization and a preliminary discussion of procedures.

At the second meeting of this Central Conference Committee held in New York City, January 12, 1927, the following resolution was adopted:

> RESOLVED that the questions which have been raised in regard to various methods of school ventilation can best be settled by studies of the actual results, methods and conditions obtaining in schools ventilated by different procedures and operated under different conditions.
>
> Whereas, it is at present impossible for the Central Conference Committee to agree on analytical standards for judging of the quality of school room and air, therefore be it
>
> RESOLVED that the problem may best be attacked in three phases.
>
> 1st—A study of the effect during the ventilation season (Nov. 1–March 30) on the health of school children of different school room atmospheric conditions as produced by different methods, judgment of the success of these methods to be based primarily on records of illness among pupils, particularly of respiratory diseases in relation to pupil sessions.
>
> 2nd—A collection of chemical and physical data on the atmospheric conditions which obtain with a correlation of same to data obtained under first paragraph above.
>
> 3rd—A study of the ventilation methods associated with the conditions found under 1 and 2.

If this program is approved by the Conference Committee on Ventilation,

* Progress Report of the Committee on Heating and Ventilating presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati., O., October 19, 1927.

the Central Conference Committee will study the results obtained by various groups of investigators along the lines outlined in the resolution

> (at Rochester, Syracuse, New Haven, etc.) and will report upon such results as they have accumulated. It was agreed that this resolution be placed before each of the members of the Conference Committee on School Ventilation by its representative member on the Central Conference Committee. After meeting with the approval of the members of the Conference Committee on School Ventilation this Central Conference Committee may proceed with the examination of data obtained in various school ventilation studies such as Syracuse and New Haven.

This resolution was endorsed by the American Public Health Association Committee at its meeting, February 24. It had been ratified by the New York State Committee on Ventilation at its meeting, January 24, 1927.

Other matters for special consideration at this meeting on February 24, are suggested in letters under date of February 21, 1927, from Raymond H. Greenman, Secretary of the Rochester Committee, to C. M. Baker, Chairman, which refer to the action of the Rochester Fresh Air Indoors Committee in tabling the recommendations they had prepared to submit to the Board of Education. Commenting on this action, Mr. Greenman states:

> In taking this action, it was the sense of the Committee that they were not prepared to submit any recommendations to the Board of Education which involved the expenditure of a large amount necessary for alterations and additional equipment in the two schools as recommended by the two collaborating societies, until such time as the two societies were agreed on the objectives to be obtained in the test.

THE RATING TABLE

Another letter dealt with the "Rating Table" for evaluating the results of the study, submitted to the Rochester Committee by the Committee of the American Society of Heating and Ventilating Engineers.

In view of the previous endorsement of the resolution of the Central Conference Committee, the committee rejected the use of the rating schedule proposed by the Heating and Ventilating Engineers, which not only was inconsistent with the resolution, in that it proposed to make air conditions the criterion of success rather than the effect on the health of the pupils, but was based on a series of arbitrary standards, the virtues of which were the subject of the investigation.

The attitude of one of the more prominent members of the Rochester Committee is illustrated by the following extract from this letter:

> Mr. Tracy (superintendent of buildings and repairs) does not want to adopt any standard in the test which will modify the standards at present in use in the public schools, which call for dry bulb temperature 67 to 69 degrees, relative humidity at least 50 per cent, air exhaust over 300 cubic feet per minute.

After consideration of these matters, the Committee defined the following course of action:

1. The Committee is the proponent of no particular system of ventilation, but is open-minded on this question.

2. The Committee declines to participate in the Rochester Study if the "rating schedule" proposed by the ventilating engineers is employed.

3. The Committee must refrain from further action in the matter pending the final ratification or rejection of the resolution adopted by the Central Conference Committee, January 12, 1927.

On February 26, 1927, following the ratification of this resolution of the Central Conference Committee by your committee, the following letter was sent to W. H. Carrier, Chairman of the Central Conference Committee, by Professor Winslow:

> My dear Mr. Carrier,
>
> The agreement we reached at the Central Conference Committee in regard to criteria for school ventilation has been ratified by the New York State Commission, and by the A.P.H.A. Committee. I am somewhat disturbed to hear that there is opposition among the ventilating engineers to this criterion, as it seems to be the only possible compromise

on which the various parties concerned can hope to meet. We have all of us thrown away our preconceived notions and come down to the ultimate fundamental, the health of the child, and if the ventilating engineers cannot meet with us on this basis, I must confess that I can personally see no very hopeful prospects of further coöperation.

Sincerely yours,
C.-E. A. WINSLOW.

The fact that Mr. Carrier was rather seriously ill at this time probably accounts for the fact that there is no reply to the above letter. Under date of June 25, 1927, D. D. Kimball, the other member representing the New York Commission on the Central Conference Committee, received the following letter from Mr. Carrier:

Dear Mr. Kimball,

Thank you for your letter of June 11, regarding the committee work on ventilation.

I would advise that I have taken the matter up at the last meeting of the Central Conference Committee and they are not willing to endorse the proposed motion. In their viewpoint the situation so far as they are concerned is a deadlock.

I shall be able to advise you further after the semi-annual meeting next week.

Sincerely yours,
W. H. CARRIER, *Chairman.*

This action seems to preclude for the moment the possible joint participation of the representatives of the American Public Health Association and of the American Society of Heating and Ventilating Engineers in the proposed Rochester Study.

From the angle of the Rochester Committee, the following extract from a letter from the Superintendent of Schools, Herbert S. Weet, to Mr. Greenman, under date of June 28, 1927, is also of interest:

At the meeting of the Board of Education yesterday, your two letters concerning the next step in the matter of ventilation were presented and discussed. This whole thing comes at a time when our only sound course is to stand still. Our Building Department is so completely overwhelmed already with the repairs and other work connected with putting our buildings in shape for school in September that it will be unable to reach much of the things that have already been agreed upon. Further there is altogether too much involved in this undertaking to justify any steps that would depend upon the scant consideration that it will be possible for us to give the subject before the opening of school in September.

STUDY DELAYED

Thus, the Rochester Study was "apparently arrested" in June, but lest there might have been some recent activity, in view of this meeting on September 29, I addressed to Mr. Greenman a request for "latest information regarding the status of the proposed study." To date (October 14, 1927) this letter has not been acknowledged.

Apart from the Rochester test, the Committee has been interested in the studies in New Haven, Syracuse and Cattaraugus County of the effects of different types of ventilation on the health of school pupils. The first of these has been conducted under the direction of Dr. Leonard Greenberg, while the latter two are field studies of the New York Commission on Ventilation.

NATURAL VENTILATION COMMENDED

The results of the New Haven and Syracuse studies, which were of a preliminary nature and should not be clothed with greater reliability than the methods warrant, are in agreement to an astonishing degree in confirming the findings of the New York State Commission on Ventilation, that from the angle of the health of the pupils, as indicated by the incidence of respiratory illness, natural ventilation (where local conditions permit its use), is superior to that accomplished by mechanical means under average conditions of operation.

These studies are being continued during the present school year under conditions that should produce thoroughly reliable data not only as to the incidence of respiratory illness but as to the air conditions as well.

In the Cattaraugus County Study, which was restricted to one and two room rural schools, the numbers of individuals under the various conditions were so small and the conditions so varied and

variable, that there was no apparent relationship between air conditions (as indicated by dry bulb temperatures) and respiratory illness among the pupils.

An impression of the air conditions in these rural schools may be gained from analysis of the data collected by the Commission's observers on the occasion of their visits to the schools.

The average temperatures were:

Ceiling	85.7° F.
Breathing level	69.7° F.
Floor	58.1° F.

or an excess of 27.6° F. at the ceiling over that at the floor.

A single observation showed the following temperatures at the different levels:

Ceiling	116° F.
Breathing level	77° F.
Floor	61° F.

The average of several observations in a single school showed temperatures at the 42 inch level to be 24° higher than at the floor. In another school the average of the ceiling temperatures was 102.5° F. while that at the breathing level was 77.8° F. or an excess of almost 25° F. at the ceiling. These figures are cited to give a picture of the heat distribution vertically. Laterally, similar conditions exist and it will suffice to mention that in one school the temperature on top of one occupied desk was 40° F. lower than another in the same room.

The discovery of these conditions has led the Commission to the adoption of the following policy toward the Cattaraugus County Study during the coming winter:

1. The collection of data regarding dry bulb temperatures, health and attendance by the teachers will be continued.

2. These records will be supplemented by observations of relative humidity, floor, ceiling and desk top temperatures as frequently as is consistent with other phases of the program.

3. The major activity of the Commission's observers will be to collect data in some five or six schools in which by combinations of more adequate heating units with various types and degrees of weather proofing, a serious effort will be made to maintain air conditions generally considered more conducive to health than those found during the past year.

DR. LELAND O. HOWARD RESIGNS

DR. Leland O. Howard, a diligent contributor in the field of public health and for 33 years chief entomologist, Bureau of Entomology, United States Department of Agriculture, has resigned. For 50 years Dr. Howard has been in government service. He has passed his seventieth year and although he has asked to be relieved of administrative responsibilities as chief of the bureau he is not retiring from active service, but will continue his work in the field of entomological research. Medical entomology and parasitology are his special interests.

Dr. Howard has earned recognition in entomology by his investigations and he was a leader in the campaign for the elimination of the mosquito and in the anti-house-fly crusade.

Dr. Howard is a member of the National Academy of Sciences, the American Philosophical Society, and the American Academy of Arts and Sciences. For 22 years he was permanent secretary of the American Association for the Advancement of Science and was its president in 1920–21. He has been elected to honorary membership in several foreign scientific societies and has the distinction of being the only American member of the Academy of Agriculture of France. He graduated from Cornell University where he received his bachelor of arts and masters of arts degrees. He received his Ph.D. and M.D. degrees from Georgetown University and honorary degrees of LL.D. from University of Pittsburgh and Sc.D. from University of Toronto.

Dr. C. L. Marlatt of the staff of the Bureau of Entomology since 1888 will succeed Dr. Howard.

HAS PROHIBITION PROMOTED THE PUBLIC HEALTH?*

HAVEN EMERSON, M.D., Fellow A.P.H.A.

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THE BEST statement of the effect of alcohol upon the human organisms is in my opinion that of the distinguished advisory committee of physicians in its report to the Central Liquor Control Board of England in 1918.

With their conclusions I am in entire agreement and it might be better for us to resolve ourselves into groups for studying the subject rather than to engage as we are asked to do to-day in a repetition of the obvious fact that the knowledge existing in the realms of economics, sociology and the medical sciences upon the individual and collective results of the use of alcoholic beverages is scanty and imperfect.

As the committee states in its preface, "Apart from the economic aspect (liquor bill 8 times the interest on the national debt) it is admitted by all parties that the misuse of alcohol exercises a considerable influence on health and longevity and it is contended by one large section of opinion that it is a main cause of crime and poverty. The ill effect on individual and national efficiency of excessive indulgence in alcohol is not disputed. It is remarkable, therefore, that throughout the world lack of knowledge still prevails and there is no authoritative scientific work which gives or seeks to give the required information."

The principal conclusions of the committee are few and brief:

(a) The main action of alcohol (apart from the effects of its continued excessive use) is confined to the nervous system.

(b) Alcohol is a narcotic rather than a stimulant in action.

(c) Its habitual use as an aid to work is physiologically unsound.

(d) Its nutritional value is strictly limited by its drug and toxic effects.

(e) The ordinary use of alcohol should not only be moderate but should also be limited to the consumption of beverages of adequate dilution taken at sufficient intervals of time to prevent a persistent deleterious action on the tissues.

If in a matter so relatively simple to determine by objective methods as the effects of alcohol on the human organism, we find wise and careful scientists admitting the present serious limitations upon their knowledge, how shall we deal adequately with the effect of that most complicated social experiment in national legislation and enforcement upon the public health of the United States in the past seven years, the Eighteenth Amendment, when as a matter of fact we find it increasingly difficult to detect and relate with entire honesty the degree and direction of trends in public health in fields of effort relatively stable.

NEW TECHNIC NEEDED FOR INVESTIGATION

A dilemma many times more difficult of scientific solution than the causes, and the effects of social and sanitary effort for the reduction of tuberculosis faces those who would answer the question of this meeting.

New methods and technic are needed to collect and present information upon which a positive answer can be given now or in the future to the doubt as to a

* Presented at the Forum Session of the American Public Health Association, at the Fifty-sixth Annual Meeting at Cincinnati, O., October 10, 1927.

possibly beneficial effect of the Eighteenth Amendment and the Volstead Act upon public health in this country.

If we knew the amount of alcohol consumed and the ages of those using it, and the concentration of the individual doses, and the conditions of time, frequency, and amount of the use of alcoholic drinks, under other conditions than as advised for medicinal or therapeutic purposes by physicians for their patients, we could give almost as exact an answer upon the health results of prohibition, as we could in the field of tuberculosis if we knew the number and virulence of tubercle bacilli and the frequency of their discharge in sputum and spray in the presence of persons young and old whose relative susceptibility we had already determined.

While we had, prior to the outlawing of commercial traffic in beverage alcohols, a crude index of the total amount of alcohol ingested per capita in the United States we have never since prohibition known its distribution with even approximate accuracy by age, or sex, of the persons using it or the time, place, or season of its use, nor anything at all of the concentration of dose used, or amount, strength or intervals of doses except as revealed in the occurrence of acute and chronic alcoholism. Estimates for 1925 vary between 16 per cent and 3 per cent of pre-prohibition per capita consumption of alcohol.

Since 1920 we have practically no information of any value as to the amount of alcohol manufactured, imported or diverted for human consumption in this country.

NEGATIVE ARGUMENTS PRESENTED

As we accept the reasonable statement that the more abundant are the sources of tubercle bacilli and the more frequently they are distributed in the presence of persons susceptible to the disease, the greater is its prevalence, so we may consider it as axiomatic that the more of the depressant protoplasmic poison, ethyl-alcohol, which passes into and through the bodies of presumably healthy human beings, taking into account again susceptibility to the toxic effects according to age, sex, race, and occupation, the more harm comes to their health. No one yet has presented evidence establishing a presumption that the use of alcohol by healthy persons at any age improves their health as revealed by function or structure, quality or quantity of life. Presence of alcohol in the body shares in causing lack of discretion in its use. Alcohol is evidently not a necessity for perfect health, or for the development of the fullest human potentialities whether physical or psychical.

It is quite academic in view of the lack of any reasonably reliable information for us to attempt to relate with any accuracy the changes in health within the past ten years to the amount of alcohol consumed per capita in this country.

To Dr. Dublin, by agreement among the discussants, has been allotted the opportunity of presenting such evidence as may be found in the records of births, deaths, and sickness.

It is perhaps not unreasonable to suggest that unless or until the appropriate vital statistics are analyzed by race, age, sex, occupation, and place of residence and related to the important factors of social and civic practice they will yield but little more than a series of new and fascinating questions, doubts, and theories.

EVIDENCE FROM FIELD OF SOCIAL PRACTICE

If possible even less reliable than the array of rates and trends evolved out of vital statistics are the observations of social practice made by those allies of the physician and sanitarian in preventive medicine, the sociologists, economists, and administrators.

It was required of me that I should offer you such evidence from the field of social practice, as seems worthy of discussion, even if it fails to convince, and with the obligation to call attention to the

fallibility of all such human observations, which are at the moment at least incapable of a truly objective accuracy.

Briefly, then, my thesis is that by indirect rather than direct evidence I arrive at the opinion that prohibition has been accompanied by benefits to health. It may be that sickness and deaths have been reduced as they most certainly will be wherever alcohol is eliminated from human dietaries in so-called moderation or intemperately, but for the country as a whole and for many separate parts or age and sex groups the evidence of this may be inconclusive.

It may be that less alcohol per capita has been consumed since than before prohibition but to support this it will be difficult to get out of the realm of estimates into accepted facts.

Is there any indirect evidence worthy of consideration?

ECONOMIC AND SOCIAL IMPROVEMENTS

1. Economic improvement among all classes in the United States has been unprecedented since prohibition and particularly among the wage earners.

Every improvement in the material wealth of wage earners improves the health of their families. There has been an increase of one-fourth in real wages, an increase of 6 billion dollars in national income, an increase in the value of former saloon properties (171,000+ parcels) and an increase in the number of persons employed in such premises.

There has been improved productiveness of industry and an almost entire absence of the serious Monday and postholiday slackening in production due to alcoholism.

According to the Guarantee Trust Company the seven years, 1918–1925, showed an increase of 23 million in savings bank depositors, and of savings 8 billion dollars, and in life insurance from 1913–1924 of 37 billion dollars. Savings bank deposits increased in Fall River, Mass., to exactly the sum of the previous drink bill of the community. There has been a vast improvement among the truckmen and stevedores of the Chelsea district in New York City.

All such evidence, if true, is quite susceptible of interpretation by a variety of other coincident causes, national and international, which have contributed to our prosperity.

2. Less delinquency from alcoholism would suggest less general use of the drug.

The decrease to which I refer has been steady and considerable among first offenders from alcoholism, according to finger print records in New York City. This is also notoriously true in Boston, Baltimore, and Rochester among the communities where the law is least well observed. Not more than 29 per cent of the 1916 rate of first offenders from alcoholism per 10,000 population was found in 1925 and 1926; and convictions of repeaters has fallen 50 per cent. Meantime a larger percentage of alcoholics observed have been gathered in by the police.

In 349 cities of the country not more than three-fourths as many arrests for alcoholism have been made as prior to prohibition.

Drunkard jail population has fallen 50 per cent in so wet a state as Connecticut.

Divorces granted on account of alcoholism have fallen 52 per cent since prohibition in the face of a steady increase in divorces for all causes.

Arrests for assault and battery have fallen three-fifths in New York City in 1924 as compared with 1910–1916.

Juvenile delinquency has diminished 50 per cent and is steadily decreasing.

It is well known that other factors and forces may have caused all these changes, and since we are dealing with a multitude of social experiments in municipal and state governments there is a wide latitude in the reliability and comparability of the records.

3. Less crimes against chastity by 33 per cent and less arrests of disorderly house operators have been recorded.

The automobile, the changing habits of use, the reduction in immigration may equally well be credited with these changes, if in fact they be accepted as reported.

4. Less need to protect children against parental neglect because of alcoholism (47.7 per cent in 1916, 21.9 per cent of all S.P.C.C. cases in 1924) is found according to the records of the Massachusetts Society for Prevention of Cruelty to Children. They report the family man as less in evidence for alcoholism and the condition of women and children under observation of the society much improved.

5. A smaller fraction of all material relief is now needed because of alcoholism than was the case before prohibition, according to volunteer agencies such as the Salvation Army, Boston Family Welfare Society (25 per cent in 1918, 9 per cent in 1925), and by report of Dr. Ellen Potter, formerly of the State of Pennsylvania Department of Welfare. There has been much less poverty and misery, very little of the destitution and brutality due to persistent heavy drinking and new recruits among heavy drinkers are steadily cut down.

Also less aid in food and clothing has been needed for women and children dispossessed on account of alcoholism. This has amounted to from one-half to one-twentieth of pre-prohibition amounts.

Reasons given for reduction in development of habitual alcoholics among wage earners are, (1) high cost, (2) uncertainty as to quality, (3) better off physically and economically and in conditions at home without alcoholic beverages.

6. Sales of narcotic drugs have been cut in half in Pennsylvania. Other causes than reduced consumption of alcohol may have been equally important and yet with the long time experience of pre-prohibition, the presumption is fair that less, not more narcotics will be used where people are less drugged with alcohol.

7. Increase in school attendance especially beyond grammar grades, reflects better conditions at home, less urgency for entrance of children in self-support, both of which may have been the result of better economic conditions, possibly due to less expenditure for alcohol.

8. Conditions of the aged and infirm in county poor farms have improved as shown by regularity of return after days of leave of absence and by the greater permanence of their rehabilitation when returned to their homes. Mean age of almshouse inmates has increased among women (44–66) and among men (39–61).

9. More milk and milk products have been consumed per capita. There has been an increase of 20 to 25 per cent according to the United States Department of Agriculture, 1913–1924. This is attributable doubtless in part to the educational effort for child health and in family food habits.

10. Records show a reduction in the percentage of hospital admissions for alcoholism who develop delirium tremens, and reduction in delirium tremens among pneumonia patients, for example, Cook County Hospital, New Orleans Charity Hospital (27.2–3.2 per cent), and Boston City Hospital (16.7 per cent to 2.7 per cent).

Hospitals are now admitting persons suffering from alcoholism in conditions which were previously thought compatible with safety of unaided recovery at home.

11. A great majority of homes for inebriates, commercial, private agencies, and governmental, are now closed for lack of patients. Only 27 of 184 which were carefully studied were really limited to alcoholics in 1922 and subsequently.

SUMMARY

In the absence of any evidence that health as revealed by vital statistics is less good in the United States in 1927 than it was in 1920, and since we have good reason to believe that less rather than more alcohol per capita is now being consumed in this country than when traffic in alcoholic beverages was an industry acceptable under the law, and since we know

that alcohol used by healthy persons does not add to their health, it is my opinion that some of the general improvement in health since prohibition is the result of outlawing commerce in alcoholic beverages. It may well be that this opinion is merely the rationalization of convictions on the subject of the harmful effect of alcohol as I saw it used in moderation and excess in the course of 15 years of hospital and private practice of medicine, but it is impossible for me to escape the force of the many converging and corroborating facts which tend to show that the housing and living conditions of the wage earners of this country have been much improved by the process of diverting the 5 to 10 per cent of their income which used to go regularly into liquor, toward more valuable commodities such as shelter, food, clothing and wholesome recreation.

I conceive the evidence sufficiently impressive, even though far from complete or accurate in the scientific sense, to justify health officers and health workers of all kinds to use all their power of education to reduce to the minimum the use of beverage alcohol in their communities, and may I suggest that example is a forceful way of teaching and worth more than millions of words.

NOTE: *The statistical phase of this subject, as presented by Louis I. Dublin, Ph.D., of the Metropolitan Life Insurance Company, New York, N. Y., will be published in the January* JOURNAL.

THE DELTA OMEGA SOCIETY

THE Delta Omega Society is a national honorary public health fraternity, the objects of which are to encourage research and scholarship among those undertaking graduate study in public health, and to recognize attainment in this field. The society was founded three years ago by Major Edgar E. Hume and Dr. C. W. Mitchell, who were graduate students at the School of Hygiene and Public Health of Johns Hopkins University. Today the Delta Omega Society has nearly 200 members, distributed in 6 chapters in the following institutions:

Alpha—Johns Hopkins School of Hygiene and Public Health
Beta—Harvard University School of Public Health
Gamma—Massachusetts Institute of Technology
Delta—University of Michigan
Epsilon—Yale School of Medicine
Zeta—University of California

The first national president of the society was Major Edgar E. Hume, M.D., Dr.P.H., and the secretary-treasurer was Richard A. Bolt, M.D., Dr.P.H. These officers were succeeded in 1927 by the following: President, C.-E. A. Winslow, Dr.P.H.; vice-president, Edgar E. Hume, M.D., Dr.P.H.; and secretary-treasurer, James A. Tobey, Dr.P.H. These officers, together with a representative from each chapter, form a national council which is the governing body of the society.

Active members of Delta Omega are elected from among the students and faculty, while alumni members are chosen from among those who have obtained a degree in public health and would have been eligible to student membership if the society had existed prior to their graduation. Dr. Charles V. Chapin was elected an honorary member of the society in 1927.

The emblem of Delta Omega, already a familiar sight at public health and medical meetings, is a gold key with a circular center. The Greek letters "Delta" and "Omega" are engraved on the obverse.

Meetings of this society have been held at the time of the last two conventions of the American Public Health Association, at Buffalo and Cincinnati. At the latter meeting a revised constitution was adopted for the society and officers elected for the coming year.

ADVISORY COMMITTEES FOR OFFICIAL PUBLIC HEALTH NURSING *

BELIEVING that the conditions involved in the question of advisory committees for official public health nursing in cities and in counties are in many respects different and that the two aspects of the problem should be considered separately, your committee has chosen to confine its work this year to a study of the second aspect alone, namely, that of the counties, and unanimously presents the following report:

OFFICIAL COUNTY HEALTH WORK AS IT AFFECTS PUBLIC HEALTH NURSING

1. *In Counties Without a Health Unit*

The nurse is employed by the county authorities or school authorities. There may be one board of health for the county or several boards of health, one for each township or village. There may be one or several health officers usually practicing physicians giving part time to their official duties for which they receive ridiculously small remuneration. Health work not being the main responsibility of these officials is seldom made a matter of consistent study and planning. Their attitude, so few of them being trained public health men, is usually frankly opportunistic. Public health nursing, in particular, is left largely to the nurse's discretion as long as there is no trouble.

The tendency among these officials, who may know little or nothing about public health nursing, is to employ some local nurse, more often than not one who has nursed in some of the official families but who is without public health nursing experience. Unqualified to lead herself, she has no leaders to follow. Should a nurse, by chance, be employed who has had the requisite experience and knows her business, she is likely to meet with inertia or with opposition to any aggressive plans which by disturbing the *status quo* might stir up some local feeling.

Such policy as there is under these passive or negative conditions is subject to change with every election and indeed, the work itself is likely to be eliminated whenever an administration pledged to economy is elected. Many public health nursing services under official county administration have not survived the first sign of hard times. This is particularly true where a mediocre public health nursing service has aroused no public sentiment in its favor. The cut induced by the assumed or real need for economy is made at the point which will cause the least public outcry.

Another serious feature of this situation is that it is difficult to persuade qualified nurses to accept official employment. Being more or less experts they soon see much that needs to be done, they know how to go about it and, if allowed to do so, they can get results. Filled with zeal and enthusiasm, they discover all too often on attempting to get under way that progress, if possible at all, must be slower than the proverbial snail. Their hands are tied by official ignorance of public health nursing, indifference or opposition to a progressive program, lack of support, or political interference and, after a year or so of half way measures, they either settle down to a mediocre level or

* This report of the Committee to Study and Report on Advisory Committees for Official Public Health Nursing was read at a joint session of the Health Officers and Public Health Nursing Sections at the Fifty-sixth Annual Meeting of the American Public Health Association at Cincinnati, O., October 21, 1927.

resign on the ground that they can make more of a contribution to health work through the freer and more sympathetic channels of the voluntary agency.

WHY PROGRAM SUFFERS

Official positions, therefore, tend to be filled by inexperienced nurses or by nurses who have not made good under the high standards of voluntary organizations. This threatens hopeless mediocrity in public service.

Given an inexperienced or incompetent nurse and an indifferent or partisan administration, the nurse's work may not be wholly wasted but it falls far short of meeting the needs or opportunities and may even be actually harmful by creating the same lack of confidence in public health nursing which is too often felt toward other public services. Neither does it contribute anything toward the promotion of the much to be desired county health units.

We have described here, we regret to say, the typical, not the exceptional situation. There are counties we hasten to add where competent public health nurses are doing excellent work under the direction of county and school officials who have vision, courage, zeal and public spirit.

There are also occasional part-time health officers who though most inadequately paid are devoting a large share of their time and thought to the sound promotion of the public health.

What are some remedies for this generally prevailing and unsound situation?

It has been suggested frequently that it is a mistake to inject a highly trained public health nurse into a situation where, by virtue of her special education, she is far in advance of official thought; that it would be better to use a less ambitious or less educated nurse, willing to jog along at the prevailing pace and make progress by inches. Did such a concession lead to ultimate success, it might be acceptable in spite of a certain loss of human life which perhaps might have been prevented. Experience shows, however, that the inexperienced nurse not only does not advance beyond a certain point, but is so unable to cope with the many unfamiliar complications that she flounders into discordant and destructive relations with the very agencies and workers whose understanding and support are essential. This then does not appear to be the way out.

We have said that there are exceptional situations where everything goes well. What are the factors that make for this success and can they be generally reproduced? The main factors seem to be three:

1. Public officials elected for their fitness and personal quality rather than their partisan assets
2. A nurse who knows what she is about
3. The absence of interference from partisan politics with personnel or policy

The idealist would say that these factors are all reproducible and that if we would only insist upon them, all would be well. The realist replies that human nature and partisan politics have never yet been purified by fiat and that while aiming at and working for these ideals we need expect no universal miraculous conversion.

The substitution of the county health unit for one or several boards of health and part-time health officers will be urged by many as the only sound corrective. Here we can heartily agree with the understanding, however, that we mean units headed by trained public health men and with the reservation that even county health units are not wholly free from the interference of partisan politics.

We must take into account, however, that after 15 years of effort there are but 307 counties or districts having a full-time health officer out of 2,600 or 2,700 counties in which the population is wholly or predominantly rural. We have at least a quarter of a century's effort ahead before the county health unit system becomes universal.

REMEDIES SUGGESTED

In the meanwhile, are there any other practical remedies? There seem to your committee to be at least two measures which should be substantially beneficial: one—the alliance of the county officials or school officials with a voluntary agency officered by disinterested, intelligent, public-spirited citizens; or two—putting behind the public health nursing service the strength of the same citizens through the medium of an advisory committee to the public officials having jurisdiction.

Beyond the comment that there may be several safeguards in a partnership between official and voluntary agencies under conditions not so difficult of achievement, we shall pass to the purpose of this report—the consideration of the advisory committee. What purpose might it serve?

1. To aid in building public sentiment in support of a growing service and opposed to unnecessary budget reductions
2. To assist officials to maintain a high grade of nursing personnel and work in the face of partisan interference
3. To maintain continuity of nursing personnel and of policy in times of trouble or sudden administrative changes
4. To gain the confidence and support of the public through its non-partisan disinterestedness
5. To represent the community and its needs to the officials
6. To assist the officials in planning far-sighted measures for the treatment of problems uncovered in the course of the work
7. To secure private funds to supplement public funds in emergency and for such features as cannot be provided legally out of public moneys.

These broad functions do not confer upon the committees any authority over the health officer's performance of his legal duties. They have to do rather with general policies and plans.

No one who has dealt much with committees can deny that a committee charged with these responsibilities could be a liability rather than an asset. Whether it would be or not would depend almost wholly upon its personnel. An unwise selection might result in any of several evils. Instead of protecting the service from partisan politics, the committee might play politics itself. It might keep things at a standstill through rival personal ambitions of its members, through visionless conservatism, through paucity of intelligence. On the other hand, by assuming an officious or arrogant attitude, it might make itself a nagging nuisance, or it might in its zeal try to force too rapid a growth. Any of these dangers might exist in a badly chosen committee. To avoid them, the committee members should:

Serve without pay

Represent no partisan politics nor self-seeking interests in the community

Be chosen for their intelligence, public spirit, generally known integrity and good will.

To perform the functions suggested above, a committee of private citizens, or with a predominance of private citizens would seem best suited—and one having both men and women. Nominations might be divided between the officials and certain non-official groups. Overlapping terms of office of five years each would assure familiarity with the work and consistency in policy.

II. Counties With a Health Unit

Turning now to counties with a full-time health officer, devoting his entire attention to the health needs of the county, it may be argued that advisory committees, while needed in situations described above, are quite unnecessary to a county health unit. Here, the public health nursing service may be presumed to be understood and to have intelligent support and direction. The trained health officer should know more about the work than any group of laity however well informed. Granting the truth of these arguments when the health officer

is both qualified and a good man, let us first consider whether a committee might not be helpful even to him, and then what the situation may become if he is not trained or is politically minded.

It is obvious to any thoughtful observer of civil government that a public official faces many difficulties, sometimes almost insurmountable in his efforts to maintain a high grade of service. There are many political deterrents in the path of even the most able and honest of administrators. In fact, the security of his tenure of office is frequently in inverse ratio to the aggressiveness of his work unless he has strong support. The best support he can have comes from an understanding and appreciative citizenry which may usually be acquired by three things: visible results; a constant process of education; the outspoken advocacy of influential citizens. By very reason of his devotion to duty the competent health officer may be much more in need of such community support than the health officer who is derelict in duty, incompetent or indolent. This can perhaps best be assured by a non-partisan committee having the respect and confidence of the people and an intimate knowledge of the problems and performance of the unit.

Quite aside from the need for a defensive group is the value of a small compact increasingly intelligent constituency of leaders who are on hand to help think through and carry out health policies. We venture to assert that many a health unit which has gone down to defeat after a year or two of existence might have survived had it surrounded itself with such a committee and taken on the various agencies engaged in health work as partners.

NON-PARTISAN MOBILIZATION OF INTEREST

We all need to be reminded occasionally that in the last analysis public health is the concern and the immediate task of every citizen as well as of the officials and will only be achieved when the people understand it, want it and work for it. All this can perhaps best be accomplished by the non-partisan mobilization of citizen interest.

Assuming that a high-minded health officer would take pains to select a competent and upright nurse, and an intelligent disinterested committee, it would seem that he would have much to gain and little to fear from such a committee. It would strengthen his position still more if the committee were to concern itself with the progress of the unit as a whole, having a sub-committee charged with special responsibility for the public health nursing service.

The county health unit, so well adapted for accomplishment under a good man, is equally exposed, however, to poor work under a politically ambitious or an inexperienced man. Capable nurses have complained that the health officer failing to appreciate the value of their work in the homes has confined them largely to duties which might better be done by an office nurse, a clerk or a chauffeur. This has happened, indeed, so frequently, that many nurses, ambitious to do constructive work, have refused to become part of a county health unit. Moreover, while the spoils system, so incompatible with public health ideals, prevails and features of the work may be made to serve as political issues at the hands of partisan politicians public health nursing standards are not secure even in the health unit.

During periods of inefficient or politically controlled administration, a committee through protecting the continuity and quality of the public health nursing service would help to safeguard community health. Until such time as health units are removed from partisan politics and placed in the hands of well-trained men assured of a continued tenure without interference, such a safeguard seems to be a necessity.

RECOMMENDATIONS

Your committee, therefore, defends the principle of advisory committees on public health nursing to the officials hav-

ing jurisdiction over the service in counties and townships believing that such committees, when wisely chosen, may be of greatest value in promoting an efficient public health nursing service and are needed for its protection until such time as county health administration is removed from partisan political interference.

Your committee recommends:

1. That advisory committees on public health nursing be created in counties conducting official public health nursing.

2. That these committees be charged by the officials having jurisdiction to whom they are responsible with the following duties:

1. To aid in building public sentiment in support of an efficient public health nursing service.

2. To assist the officials in maintaining a high grade of nursing personnel and work.

3. To assist in maintaining continuity of nursing personnel and of policies.

4. To gain the confidence, support and participation of the public.

5. To represent the community and its needs to the officials.

6. To assist the officials in planning far-sighted measures for the treatment of problems uncovered in the course of the work.

7. To secure private funds to supplement public funds as needed.

3. That these committees, where there is a health unit, be advisory; where there is no health unit be given responsibility for the policies and general control of the work and the appointment of the nurse.

4. That the members serve overlapping terms of five years each; that one-half be selected by the responsible officials and one-half appointed on nominations of representative voluntary agencies interested in health work; that the committee include both men and women members.

ELIZABETH G. FOX, *Chairman*
FRANCIS X. MAHONEY
HENRY F. VAUGHAN
MARY S. GARDNER
C. C. SLEMONS
ELSBETH H. VAUGHAN
JAMES A. TOBEY
ALICE E. ROTH

This report was accepted and the recommendations were adopted.

DISCUSSION

Agnes Martin, R.N., Syracuse, N. Y. —The importance of the relationship of the non-official and the official agency, referring particularly to the pre-medical school service, has been brought out at this meeting. At the meeting of the Child Hygiene Section addressed by Mrs. A. H. Reeve, President of the Parent-Teachers Association, and in the address given by Dr. Josephine L. Pierce, President of the Ohio State Federation of Women's Clubs, this same thought was brought out. This important measure of using lay people in our service has been emphasized right straight through and it is very opportune that we would have this final recommendation come to such an influential and important point as it has in this session.

William De Kleine, M.D., Fargo, N. D.—This committee has brought out something that every one of us should carry home, especially those working in county districts. How any nurse or how any health officer wants to work in a county without the backing of an official committee other than the official representatives of the community is more than I can understand.

I have seen a number of counties where nurses and health officers have been working by themselves and too often it results in trouble. And where they have the official backing of the citizens other than the official representatives of the community, they can get much farther.

I just want to give one word of warning in

regard to the selection of the persons on this committee. We should not just select individuals because of their high standing in the community only. They should be selected because of their special interest, if they can be found, in public health and usually we can find such persons if we look hard enough for them, both men and women.

A person who has a very wide political influence in a community is a valuable person necessarily on such a committee, but a person vitally interested in public health and willing to study public health is a much more valuable person, I believe, because his influence with the official agencies will be of such a character that it will tend to build up the right type of public health in the community. The committee is to be highly commended upon the splendid report which Miss Fox has written. She is deserving of most of the credit. I sincerely hope that everyone here engaged in county health work of one kind or another—she refers entirely to county health work—will carry this suggestion home with him and resolve not to carry on public health work in the townships, whether it be nursing or other types of public health work, without the backing of the committee that she recommends.

Sophie C. Nelson, R.N., Boston, Mass.—I feel a little embarrassed about discussing this from a county point of view inasmuch as I represent a committee in the city of Boston. But since Boston is very often considered provincial, perhaps that can be my excuse.

I want to speak from two points of view: from my point of view as a member of a nursing advisory committee, and from the point of view of our health commissioner in Boston who is a member of this committee but, unfortunately, could not stay here for this meeting.

We have had a definite change in our trend of thought as to where public health work and public health nursing belong and most of us have been sold more or less to the idea that it is an official responsibility. Those of us who have been particularly interested have labored long and diligently in trying to create an opinion toward the support of public health nursing in particular by official agencies. We have seen services after services turned over from private agencies to public agencies and presumably we thought all would be sweet and rosy. As a matter of fact, it has not been. And Boston is one of the very good examples of what is happening in many places. In the last three years two very definite services have been turned over to the Health Department for its administration. We have been in the position of falling between Scylla and Charybdis in public health nursing in Boston. I am sure Dr. Mahoney would support me in the statement I made that the only thing that has saved the situation has been an Advisory Committee on Nursing in regard to the nursing situation, and an Advisory Committee for the Health Commissioner in relation to all his other duties.

For the first time in the city of Boston we have had those two advisory committees. They have worked satisfactorily from both points of view. From the point of view of the unofficial agencies they have been sure of the continuance of their work not only qualitatively but quantitatively. From the point of view of the Health Commissioner, he has been able to interest all of us as citizens of Boston in his difficulties and in his problems. And the very direct reaction of all of this has been that for the first time in the city of Boston, have we been able to keep the health officer through a change of political administration. That is an outstanding thing that has happened in Boston in public health with Dr. Mahoney's second tenure of office under a Republican administration. I am sure Dr. Mahoney feels it would not have been possible unless he had been able to enlist the interest of the people who used to sit on the other side of the fence and crab loudly in terms of what was not being done in the Health Department.

I am sure that all our official work, and this includes public health nursing under discussion, has its only salvation in getting and in enlisting and keeping the interests of the unofficial groups and certainly the media suggested this morning, which is the Advisory Committees, seems for the present to be the solution.

Miss Martin—Mr. Chairman, may I move that the committee be continued?

Miss Fox—As Chairman of that committee I should like to speak to that. I think it would be very much better to dissolve that committee and create a new one which has a city point of view. Many of the members of that committee know county work very well but not city work. The work of the committee next year will be to consider the same subject with respect to cities and I think the committee should be reconstructed.

Miss Martin—I withdraw that motion and if it is agreeable to the Chairman, I should like to

substitute another motion—that we recommend to the Section Councils of the Health Officers and Public Health Nursing Sections that the work of the Advisory Committee for Official Public Health Nursing be carried on with such changes in personnel as may be needed to study from the municipal point of view.

The motion was seconded and carried.

NOTE: Because of the changing trend of volume of public health nursing from unofficial to official agencies, a joint committee was appointed in 1926 representing the Health Officers' Section and the Public Health Nursing Section to study the feasibility of advisory committees in relation to public health nursing in official agencies.

This first report deals with the rural situation. Its recommendations were accepted, and it was decided to continue the committee with some change in personnel and to study further the question of advisory committees in relation to public health nursing in official agencies in cities.

Such a committee will carry on with the hope of arriving at some conclusion in relation to the best possible method of attaining and maintaining standard public health nursing practice in official agencies.

INTERNATIONAL MILK DEALERS

THE International Association of Milk Dealers held its Twentieth Annual Convention at Columbus, O., October 19–21, when the following officers were elected:

President, Patrick D. Fox, Borden's Farm Products Co., New York, N. Y.; Vice-President, W. H. Forster, The Pure Milk Co., Ltd., Hamilton, Ont.; Treasurer, W. B. Wanzer, Sidney Wanzer & Sons, Chicago, Ill.; Executive Secretary, R. E. Little, Int'l Assn. of Milk Dealers, Chicago, Ill.

Board of Directors: Patrick D. Fox, Borden's Farm Products Co., New York, N. Y.; W. H. Forster, The Pure Milk Co., Ltd., Hamilton, Ont.; W. B. Wanzer, Sidney Wanzer & Sons, Chicago, Ill.; A. Kristoferson, A. Kristoferson, Inc., Seattle, Wash.; C. F. Whiting, Whiting Milk Companies, Boston, Mass.; I. D. Baxter, Western Maryland Dairy, Baltimore, Md.; L. N. Learned, Clover Farm Dairy Co., Memphis, Tenn.; Milton Hult, Superior Dairy Co., Davenport, Ia.; Wayne A. Hood, Pure Milk Dairy Co., San Diego, Calif.

In his presidential address, F. H. Kullman cited three problems facing the industry.

"*First,* there is less money being spent for milk because more money is being spent for automobiles, radio, high rent and milk in other forms than fluid milk.

Second, to what extent, if any, are we yielding in our sales because of intensive advertising of food products other than in the dairy field? We know what the meat people have done; we know what the bakery and pastry people have done and are planning to do further; we know what the candy people have done, and I now know they are entering upon a great national advertising campaign; it is unnecessary to recite the tremendous amount of appeals that have been made to the American public by the different soft drinks.

Third, while it is probably not nice to talk about your relatives, still the question must be asked whether we admit that the half-million dollar campaign of the evaporated milk interests will not affect us at all. If we are safe and immune to these attacks, then we have no problem of national or coöperative advertising. If we are not immune, we may have a problem. The question is, "Have we a problem?"

AN EPIDEMIOLOGICAL STUDY OF UNDULANT FEVER IN MICHIGAN *

PAUL F. ORR, M.D.

Bureau of Epidemiology, Michigan Department of Health, Lansing, Mich.

AND

I. F. HUDDLESON, D.V.M.

Bacteriological Section, Michigan Agricultural Experiment Station, East Lansing, Mich.

THE PRESENT study began in June, 1926, and since that time sixteen cases of undulant fever have been investigated. This is a small number but a careful personal investigation of all cases was made, not only from the epidemiological but also from the clinical and clinical-pathological standpoints.

Of the sixteen cases the author considers the diagnosis definitely established in each case. From six of the patients *Brucella melitensis* variety *abortus* was isolated, from either the blood or urine. The remaining ten cases not only gave a typical clinical syndrome of undulant fever but also gave a specific agglutination with the above organism in dilutions ranging from 1:640 to 1:10,000. All of the sixteen cases gave a typical clinical syndrome except one which was complicated by a sinus infection. The cases were distributed throughout 10 of the 83 counties of the state. While the heaviest population of the state is located in the southern part where most of the cases have occurred, the number of cases is too few to indicate to any extent the distribution of the disease over the state.

It has been our experience that the more publicity we have given and the more we have looked for the disease, the more cases have been recognized. This statement is supported by the number of cases in Oakland and Monroe Counties where much publicity has been given the disease. Direct contact has been made with members of the medical profession while further publicity was given through the medium of the press.

Of the sixteen patients, six had been living on a farm at or prior to the onset of symptoms. One patient was living in a city of 3,000 population; four in cities of approximately 15,000; four in cities of approximately 50,000 and one in a city of over a million population.

The sanitation of the homes and surroundings of nine of the cases was distinctly good. Five of the patients were living in an environment of fair sanitation and there were only two in which the sanitation was very poor. There seemed to be no relation, whatever, between sanitation and the occurrence of the disease.

AGE DISTRIBUTION

The age distribution is very wide, the youngest patient being 9 years of age while the oldest was 63 years of age. The mode was between 30 and 40 years. One patient was under 10 years, two patients between 11 and 20, three patients between 21 and 30, six patients between 31 and 40, three patients between 41 and 50 and one over 50 years of age.

There were thirteen males and three females among the patients. Of the three females, two were between the ages of 40 and 50 and had just passed the climac-

* Read at the session on Preventive Medicine and Epidemiology at the Fifty-sixth Annual Meeting of the American Public Health Association, at Cincinnati, O., October 18, 1927.

teric. The other was a girl of 9 years; this case was complicated by a sinus infection.

All patients belonged to the Caucasian race.

There were thirteen patients who were married and three who were single, the latter cases being between 9 and 15 years of age. There were no adult single patients.

As might be expected, there were more farmers involved than individuals of any other occupation or profession. Of the sixteen, four were farmers, three mechanics, three school children, two insurance brokers, two housekeepers, one of whom lives on a farm and does farm work, milking and taking care of cattle. One was a dairyman and one a merchant.

HISTORY OF PATIENTS

Fifteen of the patients have never been abroad nor in the tropics, the other one made several trips to England and France on a transport during the War. He had shore leave at various ports of England and St. Nazaire, France. He did not stop at any of the Mediterranean or African ports. He was stationed at Cuba for four weeks during 1918 but he had no illnesses during or shortly after this time, the first suggestive symptoms occurring four years later, so there seems to be no apparent connection between the infection with undulant fever and his trips abroad. Seven of the patients have never lived on a farm, five of whom have never been around cattle or other animals which are susceptible to contagious abortion. The other two of the seven have had slight occasional contact with cows but in both instances there is no history of any abortions in the animals. Two patients lived on a farm only during their boyhood and there is no history of animal contact within recent years. Five of the patients have always lived on farms; one of these is a boy 15 years of age but he has had contact with only a few animals, none of which gave a history of the infection. The other four patients who are farmers over the age of 30 years, have herds of cattle which give a definite history of contagious abortion. There are two others who have lived on farms during the past three years and both of these patients own herds which are infected. The last six patients are the only ones who have had opportunity to become infected by contact or association with infected cattle. By contact I mean the feeding, milking, care and treatment of the animals or the disposal of aborted foetuses.

There has been no contact in any of the cases with other animals infected with contagious abortion (Bang's abortion disease). One patient raised hogs extensively in addition to the dairy work but there was no history of abortion among these animals. There is very little infection of hogs with Bang's abortion disease in the State of Michigan.

Nine patients gave a history of some association with horses. But there have been no reports of any contagious abortion among horses in the State of Michigan. None of the patients have been around sheep; likewise with this animal there have been no reports of cases of contagious abortion in the state.

In no case have any of the patients ever been around goats. Particular care was used in obtaining any history of contact with this animal, as we know that infection with *Brucella melitensis* has, up until the past four years, always been associated with goats. Through the State of Michigan goats are being used to a certain extent as milk producers. There are some herds which produce milk largely for infants' use on a commercial scale. While there are many families living in the environs of the larger cities who keep one or two goats to supply the family with milk, none of the cases of undulant fever that we have investigated give a history of having ever been around goats or used goat's milk.

Of the sixteen patients, all had been

using cow's milk in one way or another at the time of and prior to the onset of symptoms. Milk was used as a beverage in all but one case, this patient using it, however, on cereals. Seven of the sixteen drink at least one pint of milk each day, five drink about one-half a pint daily and three use it as a beverage only occasionally. Two of the latter use milk and cream regularly, however, on cereals and in coffee. In every instance the milk that has been used by the sixteen different patients has not been pasteurized but has been consumed raw.

The study of the milk supply of the sixteen cases has not been completed as yet. So far definite evidence of contagious abortion has been obtained in the herds supplying milk to nine of the sixteen patients. The source of supply for five cases remains to be investigated while it was impossible to obtain any information as to the cattle producing the milk used by two patients. We have been successful in isolating the *abortus* variety of *Brucella melitensis* directly from the milk supplied to five of the patients of this series. With the examination of further samples undoubtedly this number will be increased.

So far the epidemiological data have been quite satisfactory, the evidence accumulated appearing to uphold our suspicion that the consumption of raw milk produced by infected cows is the essential cause of undulant fever in man, at least in Michigan. This is not surprising when we recognize that Malta or undulant fever occurring in the Mediterranean countries and elsewhere, which is caused by an organism practically identical to the one which we find in our cases, has been extensively studied and has been found to be caused primarily by the consumption of raw milk obtained from infected goats.

CASES SCATTERED

Our cases are widespread over the state and there has been no contact directly or indirectly between any two of them and no evidence in any of the cases of the infection arising from animals other than cattle. As to whether the infection in our cases was acquired through contact with infected animals or through consumption of infected milk, the evidence is mostly in favor of the latter. Of the sixteen patients, only six have been in contact with infected animals sufficiently to presuppose a possibility of acquiring the infection in that manner. It cannot be proved that infection was not so acquired, especially when taking into consideration the hygienic habits of some farmers. On the other hand, all sixteen of the patients consumed milk and in each case this was raw milk. Of course, one must remain unbiased on a matter of this type but I take the attitude usually taken in clinical medicine: if you can find one disease which can account for all of the patient's symptoms, accept this diagnosis and do not try to find two or more diseases which together would account for the same symptoms. A brief résumé of the epidemiological data of some of the cases will illustrate this point.

The patient, G. E., a male 40 years of age, has lived in Canada and the United States all of his life. He has been married thirteen years. His wife and two children are living and well. He is a machinist by trade and has never done anything else except for one period of four months when he was employed in the insurance business. He has never been on the farm nor been around cattle or other animals. About April 10, 1927, this man began to drink about one pint of milk daily; this was on the advice of a physician because the patient was much underweight. Previous to this time he had never used milk except in his tea. The onset of his present illness occurred May 1 or about three weeks after starting to drink milk which was unpasteurized and from which the abortus organism was directly isolated. Another patient, N. D., a male 25 years of age, had always lived in Michigan. He was an

electrician by trade but in January, 1925, he moved to a farm where he bought five milk cows and started general farming. During the summer of that year all five of the cows aborted. The patient did the milking and took care of the cows; this included the disposal of the foetuses as well as the treatment of the cows. More animals were added to his herd until he had 12 in all. In the past the patient had used milk as a beverage to a certain extent but in the spring of 1926 he began to drink more milk, using two to three glassfuls daily. He informs me that it was about this time that he began to develop general malaise with subsequent typical symptoms of undulant fever.

It is true that not all of the sixteen cases give as definite a correlation between consumption of milk and onset of symptoms but such as these are very significant. Considering the evidence as strongly in favor of raw milk from infected cows as the primary source of the infection in man, there are many apparent discrepancies which arise. With milk as the source of infection one would expect a preponderance of cases in the younger age group and also in females but on the contrary in our series, there were only five out of the sixteen which would fall in this category.

EXAMINATION OF PATIENTS' FAMILIES

Nothing has been said so far regarding family contacts and others in normal health who use the milk from the same infected supply. This has been carefully considered in all of our cases and in no instance has a secondary case occurred. When we consider that many of these cases remained undiagnosed for weeks and no attempt had been made toward isolation, it would appear that the susceptibility of man to the *abortus* variety of *Brucella melitensis* must be relatively slight. Members of the families of all of the sixteen patients not only gave no clinical symptoms but blood agglutination tests were all negative except in two instances and both of these were in low dilution. The father of one of the patients gave a postive agglutination of 1:100 but he has been feeling perfectly well and has had no suggestive illness other than influenza two years ago when he had fever, bronchitis and general aching. He laid off from work only two days but did have general malaise for about one month. There were no recurrent attacks. At that time he used milk only in coffee but more recently has been drinking about a pint daily. It is interesting to note that the only other member of the family, the wife and mother, has used nothing but cooked milk. She has been perfectly well and her agglutination test was entirely negative. This milk was found to contain the abortus organism and was the same supply as was used by two of our patients. These two cases lived in the same city but were widely separated and had no contact with each other.

The wife of another patient gave a positive blood serum agglutination in a dilution of 1:25 during April, about three weeks following confinement for a difficult breech delivery. This individual had slight malaise and headache during this interval. Blood and urine cultures were negative. Her symptoms subsided and three months later her blood serum failed to agglutinate the abortus organism in any dilution. Is it possible that some physical influence or reaction such as childbirth or some intercurrent infection would allow the abortus organism to gain a foothold in the human body, whereas before, their ingestion even in large numbers would result only in their destruction by the normal body? The last mentioned contact had been drinking the same infected milk but perhaps in slightly less quantity than her husband, the patient. Another point arises in her case: Does the agglutination of the abortus organism in a dilution of 1:25 indicate that she was actively infected by this organism?

Of our sixteen cases, eleven had their onset during the winter and spring months.

Is this significant when we also consider the fact that the cases, at least in our series, practically always have some pharyngitis or bronchitis? In two of our patients onset occurred about the time of the climacteric. In several others, the patients had been worrying a great deal previous to the onset of symptoms. In that six of our cases are farmers, exposure must also be considered a possible complicating factor in the occurrence of this disease.

ACCOUNTING FOR SMALL NUMBER OF CASES

About one and one-half billion pounds of milk are directly consumed in the State of Michigan each year. This would average about 40 gallons per capita consumption annually. With a large part of this supply unpasteurized and with approximately one-third of all of the cattle in the state infected with contagious abortion, it is hard to account for the small number of human cases of the infection. It is true that the more we have looked for the disease, the more cases we have found and it is entirely possible that the infection is much more common in man than we suspect. Without doubt it has occurred in the past and from present indications not infrequently either but it was probably diagnosed incorrectly or was not diagnosed at all. In the past many of the cases of typhoid fever which were not confirmed by laboratory tests undoubtedly were cases of undulant fever. A patient with the latter disease usually runs a temperature varying from 99 to 103 degrees with a regular afternoon and evening rise. This type of fever which begins to extend into the second or third week is strongly suggestive of typhoid. This is shown by the fact that local physicians suspected this disease in twelve of our sixteen cases.

The history of patient E. B. is of interest at this point as it tends to throw some light on the possible duration of the disease as well as the difficulty encountered in making a diagnosis previous to the adoption of laboratory tests for recognizing abortus infection. The patient had always been in good health up until September, 1922, when he developed an illness diagnosed clinically as typhoid fever, but it was unconfirmed by laboratory tests. The symptoms were very suggestive of abortus infection. There were two severe attacks at that time, each one of about four weeks' duration. Since that time the patient has been in poor health, having never regained his original strength or weight. On an average of about once a month during the past four and one-half years he has had attacks characterized by chills, fever, headache and some gastric disturbances. The attacks would last from two days to two weeks. At other times he would feel all right except for general weakness. In March of this year he had a severe attack which was diagnosed as undulant fever. The diagnosis was confirmed by the isolation of the abortus organism from the patient's blood. The question of importance is: Was the original illness in 1922 correctly diagnosed as typhoid or was the infection really that of undulant fever? If the latter infection was the cause of the symptoms at that time, it means that the patient has been infected with *Brucella melitensis* variety *abortus* for a period of five years. This possibility is of importance because of the economical aspect which it takes. Previous to 1922 the patient had never had typhoid fever but had had triple typhoid vaccine while in the Army four years before. The clinical symptoms of the original illness in 1922 were not only very suggestive of undulant fever but also the recurrent attacks of chills, fever, etc., during the intervening period of over four years, would be easily explained on the basis of this diagnosis.

MEDICAL PROFESSION ALERT

In our series of sixteen cases, local physicians made tentative diagnoses of influenza or "grippe" in six cases, tuberculosis in four cases, infectious jaundice in three cases, streptococcus sore throat

in three cases and toxic goiter in three cases. With five of the patients undulant fever was given as a tentative diagnosis. This latter fact is encouraging as it shows that the medical profession in Michigan is familiarizing itself with this disease and is on the lookout for cases.

After a careful study of a number of case histories of typical undulant fever, the practicing physician generally and the internist particularly should have little difficulty in recognizing this disease or at least in suspecting it, and in that case laboratory tests will settle the diagnosis just as in typhoid fever. While there are many symptoms which may or may not be present in a certain case, the picture as a whole is quite definite.

A PUBLIC HEALTH PROBLEM

There are certain definite public health problems confronting us with this disease, the first of which is in obtaining the cooperation of practicing physicians. This may be done in various ways, but the main point is to give the disease sufficient publicity so that the local physicians do not think of it purely as a disease of the Mediterranean countries caused by the drinking of goat's milk, but rather that it is an infection not uncommon throughout the States and that the etiological agent is widely disseminated and is the same organism that causes contagious abortion in cattle and other animals. This information, together with publication of carefully prepared case histories, will excite the interest of the local physicians and will put them on the lookout for such cases among their patients.

The second important problem is the establishment of laboratory facilities for routine examination of specimens for *Brucella melitensis* infections. This diagnostic service is already available in some public health laboratories and there is no reason why at least agglutination tests should not be performed in all such laboratories. Routine agglutination tests against the abortus organism with all negative Widal serums will not uncommonly locate a case of undulant fever.

Coöperation of the physicians in obtaining blood for agglutination and culture from suspected typhoid fever cases, from suspected tubercular patients with negative sputum, and also from all patients with a more or less chronic recurrent type of fever, some of which simulate influenza attacks, will aid in the recognition of most of the cases of undulant fever.

The third important problem confronting us is the careful epidemiological study of these recognized cases. As previously noted, there are many apparent discrepancies in our knowledge regarding the occurrence of this disease and it will be only through careful epidemiological observation that we will be able to answer questions now unsolved.

COURSE FOR PUBLIC HEALTH WORKERS AT NEW YORK UNIVERSITY

A COURSE in "Hospital and the Community Health Organization" is being given at New York University, Washington Square, New York, under the direction of E. H. Lewinski-Corwin, Ph.D. The lectures are given Thursdays from 6.30 to 7.45 P.M. and will continue until May 10. Fee $35.

This course on the community relationships of hospitals will offer discussions from the public health, the social and economic viewpoints, presenting questions bearing on the problem of disease and especially the relationship of the hospital to the out-patient department.

"The relationship of public health agencies to hospital dispensaries and health centers," and "The making of community health surveys and of institutional service" will be discussed during the course.

THE FLOOD IN MASSACHUSETTS

GEORGE H. BIGELOW, M.D., Dr.P.H.
Massachusetts State Commissioner of Public Health, Boston, Mass.

FROM TWO to ten inches of rain fell November 3 and 4 in Massachusetts in less than twenty-four hours. The volume of rain increased from east to west. Similar storms occurred in Vermont, in Western New Hampshire and Maine. As the season has been unusually wet, the ground was well saturated. However, had the ground been frozen there would have been an even more disastrous run off. The night of the 6th of November was cold and this helped hold some of the water by freezing. There appear to be two characteristics of a flood in this region due to the hilly character of the country: first, the sudden onset of flood in the upper waters and tributaries to such rivers as the Connecticut and the Merrimac; and second, the absence of vast areas flooded which would require the movement of large numbers of refugees great distances from their homes.

The extent of the damage in Massachusetts is even now far from completely known, and the picture of the Vermont situation cannot be visualized by us even at this proximity. Connecticut is only now feeling the crest of the flood as is the region of the lower Merrimac from Haverhill to the sea, so that this statement of the conditions must be as incomplete as it is premature.

Apparently Vermont suffered the most severely and at this writing the entire damage is not authentically known. It would seem that Massachusetts was next in the list of affected states, particularly in the western and central parts. Due to the bursting of a power dam above the town, the main street of Becket, paralleling the small river, was gutted out, and some sixteen houses and about as many other buildings were demolished. For the size and resources of the community, this was incomparably the heaviest loss. Next came North Adams on the Hoosick River. Situated between the hills, with dwellings and industries encroaching on the river, which in some places was hardly 20 feet wide, the current swept away homes, undermined streets, ruptured water mains—particularly where they crossed under the river—and flooded houses. One house from nowhere in particular was landed in the middle of the main street. A rough estimate of over two million dollars damage has been made.

All along the Connecticut River from Springfield up to Northampton, and further, wherever there was low land along the river, houses were flooded, people were driven out and there was much loss of stored foods. Refugees were housed in public buildings in all these communities. The railroads suffered severely over the divide between the Connecticut and the Berkshires. State and town roads were washed out, bridges fell, and truck gardens were ruined. The loss of life in Massachusetts will probably total about a score. Further east the Blackstone and Merrimac Rivers did similar damage but on a lesser scale. All this started between the setting of a Thursday sun and its rising on Friday. On the lower rivers the peak was not reached until Sunday or Monday.

In the rescue work, the state police stand first. They protected property, built reinforcements, evacuated threatened houses, rescued everything in sight,

and helped everyone to remain sane. The Red Cross again justified its existence and showed the excellence of the local organization while awaiting directions from Washington. In the flooded areas Friday morning saw the local unit furnishing relief. The Boy Scouts, too, gave effective auxiliary service. As always, there was spontaneous response from all communities.

For the care of the homeless when the resources of neighbors were exhausted, public buildings and churches were thrown open—all of them providing heat. Hospitals were fairly available. Practically no food want was experienced, although in some places milk was scarce for a time, more especially around Boston than in the flooded areas since the latter drew more largely on local supplies in which impaired transportation was not such a vital factor.

THREATENING DISEASES

From the public health angle, the two groups of diseases that threatened were the respiratory and the intestinal. Since heated quarters were quite generally available, except during the first few hours, exposure was a large factor only among the rescue and repair workers. Even though cold weather set in on Sunday, there has been no report of an increase in pneumonia from the affected areas, which have been carefully surveyed by our district health officers.

Regarding the intestinal diseases, the water supplies were, of course, of major importance, and the public supplies which serve 96 per cent of the population of the state stood up splendidly. The dams that seemed to be bursting on every hand were power dams. The bursting of service pipes and a few instances of dangerous washings into reservoirs and the flooding of wells were the principal menaces. Therefore, an order to boil all drinking water was issued at once. On Friday one of the state engineers began a survey of the supplies. The next day two others joined him. In certain instances chlorinators were installed, in others temporary sources were discovered, but for the most part no pollution was found. Instructions were issued for the pumping out and cleaning of all private wells that had been flooded. Extensive typhoid inoculations were recommended, and clinics were established by the local health authorities in North Adams, Becket and other communities. The state supply of vaccine was supplemented from New York City.

An interesting feature was the vivid demonstration of the isolation of Boston from the rest of the country. With the floods in Vermont, New Hampshire and Maine, which furnish so much of the milk used by Boston, a marked shortage of milk was experienced in the metropolitan area by Sunday. Other than for hospitals and households, trade was markedly curtailed. Persons were instructed to conserve milk for the young and the sick. Areas in New York, Ohio and Pennsylvania were drawn on for auxiliary supplies. Had the New York, New Haven and Hartford Railroad lines been impaired in Connecticut as were the Boston and Albany, and the Boston and Maine lines further north, a general food as well as milk shortage would have been experienced.

In general, the health in the flooded areas is, at this time, surprisingly good. What the toll of typhoid fever will be, it is too early to determine. That it will take some toll would seem inevitable. That it will be high would seem unlikely. Respiratory disease has not increased over what is expected at this time of year. The repair work is enormous but fortunately it is not being started with the added shackle or handicap of disease.

The aid of the Red Cross has been invaluable. The offers of assistance from the Surgeon-General of the United States Public Health Service, made characteristically early, were appreciated. But our burden is light compared with that of Vermont, and she is tackling her problem with a heroism that stirs admiration.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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ABORTION IN CATTLE AND MALTA FEVER

A REAWAKENING of interest in the subject of Mediterranean or Malta fever is shown by the number of papers presented at our Cincinnati meeting concerning this disease. It will be remembered that it was brought to this country during the Spanish-American War by soldiers who had taken part in the Porto Rican campaign. It was regarded as a curiosity, and with the recovery of the patients, nothing more was heard of it. Interest was again awakened in 1905, when the steamship Joshua Nicholson brought 61 milch goats and 4 billy goats from the Island of Malta to this country into which they were being introduced on account of the value of their fleece as well as their flesh. The milk was used by the crew during the voyage and a number suffered from febrile attacks identical with those of Malta fever. In five there was conclusive evidence that the infecting germ was the "*Micrococcus melitensis*," as it was called by Bruce, who discovered it in 1887.

As early as 1911, Malta fever was found in sections of Texas, particularly in the Pecos Valley into which Maltese goats had been introduced. Since that time numerous outbreaks have occurred in the southwestern part of the country and the disease is endemic in sections of the Rio Grande Valley. More recently cases of Malta fever have occurred in many sections of the United States and there is some reason to fear that they are increasing in number.

Our interest was again stimulated in 1918, when Evans showed that the *Bacillus abortus*, the cause of contagious abortion in cattle, hogs and other animals, was closely related to the germ causing Malta fever. It is now certain that there are still other organisms belonging to this group which can be distinguished only by exact serological methods.

While the disease is rarely fatal, it causes great disability and loss of time. On this account the British government appointed a commission to study the disease as it occurred in the Island of Malta. They showed that the milk of goats was the chief source of infection. Approximately 50 per cent of the goats examined gave positive agglutination reactions, and it was estimated that 10 per cent of the goats supplying milk to the Island excreted the *B. melitensis* in their milk. The animals carrying the germ in their udders are not sick, nor does any change take place in the character of the milk by which it can be detected. The disease has been practically exterminated in Malta by decreasing the number of goats and attention to the milk used for food. Since the germs are readily destroyed by heat, pasteurization will make an infected milk safe.

Contagious abortion in cattle and hogs is unfortunately prevalent in practically every part of the United States. The incidence runs very high in the Eastern States. In Connecticut, for example, it is stated that 90 per cent of the herds are infected, while in some states of the middle west, it drops to 50 per cent, and in these, 33 per cent of the animals carry the infection. These estimates may be high, since they are based on the examination of herds in which trouble has occurred or is suspected.

Sanitarians, child welfare workers, those interested directly in the milk industry and physicians in general may be said to have formed a combination to urge the greater use of milk, especially for growing children. We all agree that there is no substitute for milk and milk products. Anything which would cause the public to fear milk, or which would lessen its use, would be a calamity. With the facts presented, it is not strange that many laboratories are studying the relation of contagious abortion in cattle and other domestic animals to the occurrence of Malta fever in this country. One way of approaching the subject is the examination of bloods sent to laboratories for the Wassermann test. In Connecticut more than a thousand human sera have been examined by the agglutination test and a small number have given the specific reaction in high dilution. However, the number is small, even if these tests can be accepted as an entirely correct indication of infection from cattle. Furthermore, the enormous consumption of milk in every part of the country and the comparatively rare occurrence of Malta fever, indicate that the bovine variety of the germ is only slightly pathogenic for man.

The cream of infected milk is richer in the germs than the body of the milk. According to certain investigations, they do not multiply in the refrigerator and die out after eight days, in milk. They may remain alive in butter as long as forty days, but have not been found in cheese or in samples of market butter.

While the question is being further investigated and until positive answers can be given to the questions raised, the pasteurization of market milk is our safeguard. Except in the case of milk which comes from herds which are under strict and constant inspection, all market milk should be pasteurized before use. The facts presented so far furnish another and potent argument for the general adoption of pasteurization as a public health measure.

CEREALS AND RICKETS

IF one food habit more than another has a firm hold on the American public it is the eating of cereals for breakfast, probably on account of their variety, the attractive manner in which they are packed and the skillful advertising they receive.

About two years ago we called attention in these columns to the announcement by Mellanby that oatmeal would produce rickets in puppies. He believed that there was a toxic factor, which he called toxamine, present in this grain. This finding was contrary to what one would expect from chemical analysis and from the general experience of Scotchmen, with whom oatmeal porridge is the most popular of cereal foods.

Recently Steenbock [1] and his coworkers have shown that all cereals have a decided tendency to produce rickets. The feeding tests were carried out on dogs, which are very susceptible to this deficiency disease. The experiments were controlled by careful attention to litter mates, food consumption, growth, X-ray examination, chemical analysis of the blood, ash analysis of bone, and microscopic examination of the costochondral junctions, with the result that

rolled oats did not make an especially bad showing. Indeed it was somewhat less rickets-producing than maize in both dog and rat experiments, though more so than wheat with rats as the experimental animals. Dogs are so susceptible to rickets that a large number of carefully controlled tests were necessary to demonstrate any difference in the cereals tried.

Calcium is the fifth most abundant element in the crust of the earth, so one would hardly expect to find it lacking in the foods commonly used, yet rickets and analogous diseases are quite common in domestic animals such as pigs and chickens.

Rickets is a disease due to dietary deficiencies. It may be caused by a deficiency in lime salts or of phosphorus, a disproportion between the calcium and phosphorus, or a deficiency in vitamin D. The requirements for calcium and phosphorus are not absolute, varying with the relative proportion of calcium to phosphorus and the presence of vitamin D. One of the most common causes of rickets is a deficiency in calcium. None of the commonly used cereals contains enough calcium for an adult man when taken as the sole article of food. Polished rice, pearl barley, wheat preparations and patent wheat flour are deficient in phosphorus also.

There is no desire on the part of food specialists to limit the use of cereals, but it is necessary to point out their deficiencies and the means by which these can be overcome or corrected. Foods rich in calcium, and in certain cases high in phosphorus also, should be supplied. The treatment of cereals by ultra-violet radiation will also correct the deficiency, since vitamin D is produced by this means in such abundance that the rachitic condition can be much improved even without the addition of the minerals mentioned. In practice, milk, vegetables and certain fruits should be taken in abundance, since they enable us to utilize grains and their products to best advantage in the diet for man and animals.

REFERENCE

1. *J. Indust. & Eng. Chem.*, Aug., 1927, p. 906.

PLACE-IN-FAMILY AS A FACTOR IN DISEASE

THE STUDY of disease carries us into many bypaths, some of which lead to the discovery of valuable facts, while almost all open views of great interest in themselves.

In the past we have met with statements supported only by incomplete statistics, that the place in the family in order of birth has something to do with the liability to certain diseases. These statements have had backing which was not convincing, though curiously enough, the general idea is borne out by a careful study recently made by Dr. Still, of London.[1]

He first worked out a standard curve with which to compare his data. He insists that the first-in-family must mean the first pregnancy and not the first live child, an important point which has been overlooked. Reproduction is a sort of experiment on the part of nature just as other physiological functions are, and like them is apt to be imperfectly performed at first, but by repetition becomes more perfect through training. Statistics certainly indicate that the first efforts at reproduction result in failure more often than later ones. Again when the reproductive period of life is closing nature is apt to fall short of perfection.

Certain facts are well known. Toxemia in first pregnancies is much more common than in later ones, reaching as high as 74 per cent, and these figures are based on what may be called the grosser types, more or less easily recognized. It is probable that minor forms of toxemia, which are not recognized clinically, though they affect adversely the embryo,

occur. Entirely apart from the age of the mother at the time of the first pregnancy there is an undoubted tendency toward poor nutrition of the fetus. The weight and length of first-born children fall short of those born later. Comparative physiology gives confirmatory evidence. The eggs of pullets give chickens which are smaller than those from hen's eggs, while pigs and rabbits of the first litter are apt to be smaller than those of later ones.

Coming down to individual deficiencies, Still concludes that there is positive evidence that congenital hypertrophy of the pylorus, congenital heart disease, some other congenital abnormalities, mental deficiency and probably epilepsy, are more common in first-born than in later children, and that these abnormalities have a distinct relation to their place in the family. He selected pneumonia on which to base his standard curve, since the calling of a doctor in such cases is a matter of necessity rather than choice, and further it is a "neutral" disease, the occurrence of which is unlikely to have any relation to the order of pregnancies. In 900 cases of pneumonia (500 lobar and 400 broncho), approximately 20 per cent were first-borns. Against this, 48 per cent of cases of congenital hypertrophy of the pylorus were first-borns, while among 500 cases of tuberculosis, and 1,000 of ordinary digestive disturbances, the percentage of first-borns corresponded almost exactly with the standard curve. It is evident that first-borns are particularly prone to hypertrophy of the pylorus, or are less liable to the other ailments.

The conclusion is that first children do not enjoy the advantages of later children, due to the inexperience of the mother and of her tissues. Her skill in fertilization and handling the products of conception increase with practice. It seems likely that miscarriage and abnormal development are closely connected, and if so, the special liability to miscarriage during first pregnancies is a blessing rather than otherwise, since nature may be attempting to get rid of the imperfect products of her first efforts.

Interesting as these findings and conditions are, they have a special bearing on the English law concerning primogeniture. A curious variant of this is found in the "Borough English" custom of putting the youngest born in the place of the first. It is possible that observation has led to the belief that the last born was more apt to be free from congenital abnormalities, mental and otherwise, than the first, an idea which seems to have some foundation in facts.

Unfortunately no means of prevention exists, but it is a comfort to parents of defective first-born children to be told that they are not responsible for the defects.

REFERENCE

1. *The Lancet*, October 15 and 22, 1927.

ASSOCIATION NEWS

Photo Paul Stone-Raymor Ltd.

HERMAN N. BUNDESEN, M.D., PRESIDENT OF THE A.P.H.A.

THE new President of the American Public Health Association, Herman N. Bundesen, M.D., has been Commissioner of Health of Chicago since 1922, in which office his achievements have marked him as one of the outstanding men in public health today.

Dr. Bundesen was born April 27, 1882, in Berlin, Germany, of Danish parents, and was brought to the United States in his infancy. He was graduated from Northwestern University Medical School in 1909 and took a postgraduate course in the United States Army Medical School, Washington, D.C., in 1911. He served as First Lieutenant in the Medical Corps, United States Army.

In 1911 he began the practice of medicine in

Chicago, and soon after became connected with the Chicago Department of Health, being appointed as a part-time school health officer. He showed marked ability and rose rapidly through the ranks to the position of epidemiologist, which he held from 1914 to 1922. In this position he succeeded in establishing a remarkable record for the City of Chicago in typhoid control.

He was appointed Commissioner of Health on February 1, 1922, and has served through three administrations, two of which were of opposing political factions. At the time he was appointed commissioner he was the youngest man who had ever occupied that position.

Since Dr. Bundesen has been Commissioner of Health of Chicago the department has been completely reorganized on lines that have been studied extensively by other cities and which represent a new standard for America. Of particular importance has been the work to reduce child and maternity mortality, for which activity he received the *Chicago Daily News* prize of $1,000 on September 9, 1926, for "the most beneficial act for humanity by a resident of greater Chicago."

A further honor was conferred upon Dr. Bundesen by Northwestern University at the spring convocation of 1927, in the form of an honorary degree of Doctor of Science. The official announcement of this commencement reads as follows:

> Doctor of Science—Herman Niels Bundesen, sanitarian, epidemiologist, physician. Health Officer of the City of Chicago with a record of accomplishment in sanitation, hygiene and education unequaled in the history of that city. Member of numerous public boards and commissions; trustee of Chicago Municipal Tuberculosis Sanitarium; eminent contributor to the betterment of health conditions throughout the United States. An alumnus of Northwestern University Medical School with the class of 1909.

Dr. Bundesen also holds the chair of Professorial Lecturer in Public Health Administration at the University of Chicago.

During the time that he has served as Commissioner of Health, Dr. Bundesen has written several books on health subjects, including the care of expectant mothers. His latest work on the care of the child from 2 to 14, entitled "The Growing Child," has just been published.

Suggestions Wanted for the Chicago Meeting

Already plans for the Fifty-seventh Annual Meeting of the American Public Health Association, which will be held at Chicago, Ill., the week of October 15, 1928, are being formulated.

As the Cincinnati meeting was conceded to be the most successful the Association has ever held, indications are that the Chicago meeting will be the largest and best in the history of the Association. Again the exhibits will be a strong feature of the meeting with more exhibitors represented and more extensive exhibiting space.

What suggestions have you to offer for the Chicago meeting? What criticisms of the Cincinnati meeting do you want to make? The officers and staff of the Association ask you to submit any suggestions or criticisms you have gathered from your experience at previous meetings, which will guide in the planning of the Chicago program. Send your ideas to Homer N. Calver, Executive Secretary, 370 Seventh Avenue, New York, N. Y.

Editorial Correction

In the editorial, "Open Season for Tularemia," appearing in the November JOURNAL, page 1157, the number of wild rabbits found in the markets infected with tularemia is given as 10 per cent, instead of one per cent. The statement should read: "Relaxation of the game laws fills the market with wild rabbits, one per cent of which, according to Francis, are infected with tularemia."

Michigan Public Health Association

The Seventh Annual Joint Conference of the Michigan Public Health Association with the Michigan State Department of Health will be held some time after January 1, instead of in December as in previous years. The definite date of the meeting will be announced later.

Texas Association of Sanitarians

At the Annual Meeting of the Texas Association of Sanitarians held at Houston in November, the following officers were elected:

President, W. A. King, M.D., City Health Officer, San Antonio; First Vice-President, C. M. Adams, Texarkana; Second Vice-President, J. Bryan Miller, Bryan; Third Vice-President, Mary Kennedy, Houston; Fourth Vice-President, A. W. Dunn, M.D., Marshall.

The Association will hold its 1928 meeting in San Antonio.

New Jersey Sanitary Association

The fifty-third annual meeting was held in Princeton, N. J., December 2 and 3.

The Presidential Address, by Chester G. Wigley, C.E., of Atlantic City, was entitled "Recent Progress in Sanitary Engineering Work in the State of New Jersey."

Among the many interesting subjects presented were: Pre-school Clinics, by Julius Levy, M.D., Bureau of Child Hygiene, New Jersey State Department of Health; Diphtheria, by Louis I. Harris, M.D., Commissioner of Health, City of New York; Relation of the Physician to the Patient, from a Public Health Standpoint, by Walt Ponder Conaway, M.D., President Medical Society of New Jersey; After Effects of the Use of Serum in the Human Economy, by William H. Park, M.D., Director Research Laboratory, City of New York.

The Health Officers Association of New Jersey held a session on December 3 in connection with the Sanitary Association, at which W. W. Peter, M.D., Dr.P.H., of the A.P.H.A., presented a paper entitled: "Bear North by East."

APPLICATIONS FOR FELLOWSHIP

CHILD HYGIENE SECTION: John A. Ceconi, M.D., Dorcester, Mass.; Henry B. Elkind, M.D., Boston, Mass.

LETTERS TO THE EDITOR

TO THE EDITOR:

On page 1108 of the October number of the AMERICAN JOURNAL OF PUBLIC HEALTH, your James A. Tobey, LL.B., is credited with the following statements on the composition and food value of oleomargarine:

1. "Oleomargarine is of no value for any nutritive purpose."
2. "Oleomargarine is practically devoid of vitamins."
3. "According to McCollum (citing studies by Widmark), the use of margarine as a substitute for butter in Denmark is the cause of the prevalence of ophthalmia."

If truth had any inherent power of prevailing over error, it would be unnecessary to refer to Mr. Tobey's strange remarks. Oleomargarine is, of course, just as valuable for "nutritive purposes" as the foods and the foodstuffs entering into its composition, namely, beef fat, pig fat, peanut oil, cotton seed oil, coconut oil, salt, milk, and butter. It is a matter of common knowledge that these articles of food are nutritious and that they are eaten in one form or another every day.

If oleomargarine were "of no value for any nutritive purpose," its manufacture and sale as a food would not have been legalized by every city and state in the Union and by our federal government as it has been legalized.

Eminent scientific authority such as Wiley, Alsberg, Osborne, Mendel, Halliburton, Drummond, and scores of others have gone on record that oleomargarine is not only nutritious but wholesome.

Then Mr. Tobey says that "oleomargarine is practically devoid of vitamins and butter is rich in them." What vitamins? If it were true, what of it? But it is not true—it is not in accord with the literature on the subject. We do not have to eat butter to be well fed and healthy. We do not have to eat oleomargarine to be well fed and healthy. It is better public health advice to tell people to use milk in the diet in place of butter if economy demands it, for milk contains everything that butter contains and a lot more. It contains most valuable proteins, carbohydrates and mineral matter as well as the indispensable vitamins B, C, and E, which butter does not contain.

McCollum has never said that the use of margarine as a substitute for butter in Denmark is the cause of ophthalmia. During the late war there were nutritional disorders in many countries because the people were reduced to a starvation diet. It would be just as foolish to say skim milk caused them, or white bread caused them, or beans caused them, or potatoes caused them, or rice caused them, as to say margarine caused them.

The Medical Research Council of England, according to its *Special Report Series No. 105*, found margarine an entirely satisfactory food in an experimental diet of meat, margarine, vegetables, sugar, bread, and one pint of milk a day. This was the diet of a group of 41 boys during a period of several days. These boys gained an average of 6.93 pounds per boy and an average of 2.63 inches per boy per annum. The usual and normal average annual increase is often only from 3 to 5 pounds in weight and about 2 inches in height in a boy of the body weight of the boys in these experiments. The boys were in a fine state of health all through the years they were on this diet. "They were high-spirited and irrepressible, being often in trouble on that account, and there was a complete absence of illness among them," says

the report. The experiments upon these boys over a period of four years were carried out "to help solve the problem of what diet in quantity and quality provides adequate nutrition for growing boys and girls." This diet of meat, vegetables, margarine, sugar, bread, and a pint of milk a day was all that could be desired in producing growth in weight and height, health and "spirit" of the group of boys in the experiment. There was no butter in this diet. Hence butter is by no means an indispensable food.

Mr. Tobey also said: "If passing off a substance deficient in vitamins as a proper substitute for a food rich in them is not a fraud, what is?" His question is just pure dribble and full of false and misleading inferences. Margarine is not a substitute for butter; it is never sold as a substitute for butter; it has never been passed off as a "proper substitute" for any food. It is sold for exactly what it is. It is subject to city, state, and federal regulatory laws of the most rigid character. The inference that butter is always rich in vitamins is not supported by facts. It is often very deficient in vitamins. Margarine is by no means always deficient in vitamins.

The oleomargarine industry will be very grateful to you if you will give the same publicity to this letter that was given to Mr. Tobey's statement. Very truly yours,

Institute of Margarine Manufacturers
J. S. ABBOTT,
1049 Munsey Building Secretary
Washington, D. C.
November 9, 1927

TO THE EDITOR:

It is neither extraordinary nor important that the Institute of Margarine Manufacturers should rise up in its wrath to protest by animadversions on the product which it is subsidized to defend. Since, however, a number of persons, apparently seeking truth rather than an opportunity to promote a partisan attitude, have inquired as to the facts in support of my somewhat categorical statement regarding oleomargarine, a reply seems desirable.

While the vitamin content of fats is variable, it is generally true that butter is much richer in vitamin A than is any other kind of food fat. According to the report of the Committee on Nutritional Problems of the American Public Health Association, which appears in the JOURNAL for December, 1926 (page 1205), and which, signed by H. C. Sherman, C.-E. A. Winslow, E. L. Fisk, I. Greenwold, and T. P. B. Jones, ought to be good authority, vitamin A is an important factor in supporting growth, preventing deficiency disease, and increasing resistance to infectious diseases. This report is devoted to extolling the virtues of milk and the desirability of a quart a day for every child. It is stated here that "the supply of butter as well as of milk becomes a matter of importance to health through nutrition" (page 1207). Strangely there is no mention of oleomargarine.

Much is made of the "varied diet" by the advocates of oleomargarine. How many persons now constantly get a varied diet, based on scientific knowledge of nutrition? Certainly, it is the duty of the sanitarian to recommend that people eat those foods which are most likely to supply them with the health-giving vitamin Good butter will assist in doing this better than any one kind of margarine, or all of them put together. Studies recently conducted at the University of Oregon Medical School and reported by Dr. C. Ulysses Moore in *Northwest Medicine* for January, 1927, showed that butter contains some substance not found in vegetable fats which is essential to the growth and well being of all omniverous animals. This is one of the studies not cited in pamphlets praising margarine.

As to what McCollum says or does not say, a direct quotation (page 156) from the Third Edition of the *Newer Knowledge of Nutrition*, by E. V. McCollum and Nina Simmonds will speak for itself:

Widmark (1924) states that the export of butter from Denmark is the cause of the prevalence of ophthalmia. The population finds in margarine a substitute for butter. A few years ago margarine was prepared from animal fats which contained a little vitamin A, but during recent years there has been an increasing use of vegetable margarine, since this is cheaper. The latter is almost devoid of vitamin A.

Dr. Herman N. Bundesen, the eminent President of the American Public Health Association, in his recent book, "The Growing Child," just issued, devoted much emphasis to the value of milk and its products, especially butter (see particularly pages 36, 42, and 52–55). We have looked in vain in this excellent publication for any mention of oleomargarine or recommendations or even concession that it be used. If the undersigned were connected with the butter industry, which he is not, he would feel elated at such valuable propaganda from a scientific and unprejudiced source.

To say that oleomargarine has never been passed off as butter is utterly ridiculous, and not in accordance with facts which are notorious. Since 1904, however, it has not been profitable to color oleomargarine to resemble butter, for in that year the United States Supreme Court upheld the federal law which imposed a tax on this obvious imitation of a reliable dairy product.

Oleomargarine may be as pure as polished rice and fully as beneficial, but in spite of the ravings of all its ardent protagonists the world over, it never was, is not now, and, no matter how many calories can be squeezed out of it, probably never will be a substitute for butter.

Sincerely yours,

JAMES A. TOBEY

New York, N. Y.
November 15, 1927

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Lucy Oppen, New York, N. Y., Staff Associate, American Child Health Association
John Overton, M.D., Nashville, Tenn., City Health Officer
H. H. Pansing, M.D., Dayton, O., County Health Commissioner
Joseph D. Page, M.D., Ottawa, Can., Medical Officer in Charge National Quarantine
Paul Parrot, M.D., Quebec, Can., in Charge Vital Statistics, Provincial Bureau of Health
Earl M. Pickens, D.V.M., College Park, Md., Professor Pathology and Bacteriology, in Charge Live Stock Sanitary Labs.
Josephine P. Prescott, R.N., New York, N. Y., Supervisor Henry Street Visiting Nurse Association
Ethel M. Rice, R.N., Susanville, Calif., Community Nurse and Sheppard-Towner Nurse
Cheslie A. C. Richardson, M.D., W. Somerville, Mass., Chairman, Board of Health
Lucile Satterfield, R.N., Tiptonville, Tenn., County Health Nurse
Clayton W. Shaw, M.D., Alexandria, Ky., County Health Officer
S. M. Shoemaker, Eccleston, Md., Regent, University of Maryland
Riley Shrum, M.D., Huntington Park, Calif., Tuberculosis Clinician, Los Angeles County Health Organization
Henry C. Smiley, M.D., Redondo Beach, Calif., Health Officer
F. DeWitt Smith, M.D., Guilford, Conn., Health Officer
E. J. Stedman, Bell, Calif., Food and Sanitary Officer
Louise Steele, R.N., Woodsfield, O., County Nurse
Edith M. Stoll, R.N., Ann Arbor, Mich., Supervising Nurse, Public Health Nursing Association
Paul R. Sung, Chicago, Ill., Adviser in City Government of Wuchang Hupeh, China (Assoc.)
Carroll Swann, R.N., Atlanta, Ga., Director, Public Health Nursing
Julia B. Tappan, New York, N. Y., Director, School Dept., Cleanliness Institute
M. B. Tark, Philadelphia, Pa., Sanitary Engineer, Link Belt Company
John O. Templeton, Pittsburgh, Pa. (Assoc.)
Emerry J. Theriault, Cincinnati, O., Chemist, U.S. P.H.S.
Felix Tietze, M.D., Vienna, Austria, Executive Secretary, Austrian Executive Committee (Assoc.)
Allen Turner, M.D., Ladoga, Ind., President, State Board of Health
John G. Vaughan, M.D., New York, N. Y., Medical Missionary Work
Louis F. Warrick, M.S., B.S., Madison, Wis., State Sanitary Engineer
Fowler A. Watters, M.D., Lockport, N. Y., Director Health Service Dept., Public Schools
Winnifred W. Wencke, R.N., Richmond, Ind., College Nurse
Emanuel M. West, Newark, N. J., Rat Exterminator (Assoc.)
John D. Westrick, M.D., Defiance, O., Health Commissioner
James F. Wilson, M.D., Washington Court House, O., Health Commissioner
Perino B. Wingfield, M.D., Logan, W. Va., Health Officer
Neal N. Wood, M.D., Los Angeles, Calif., Superintendent, Los Angeles County General Hospital
Irvin S. Workman, M.D., Mt. Vernon, O., Health Commissioner

JOINT MEETING OF A.P.H.A. AND A.A.A.S. IN NASHVILLE

AT the meeting of the American Association for the Advancement of Science, to be held at Vanderbilt University Medical School, Nashville, Tenn., December 26–31, the A.P.H.A. will hold a joint session with Section N (medical sciences) of the A.A.A.S. This joint session will be held Wednesday afternoon, December 28, at 2 o'clock.

A symposium on "The Medical Problems of the South" will be given at this joint session. The program is as follows:

1. Address of the Retiring Vice-President of Section N, Rufus I. Cole, Director of the Hospital of Rockefeller Institute, New York.

2. Malaria with Special Reference to Conditions in the South. A. M. Stimson, Asst. Surgeon-General of the United States Public Health Service.

3. Parasitology in Relation to Medical Problems of the South. C. C. Bass, M.D., Dean of Tulane University Medical School.

4. Tuberculosis. (Speaker to be announced later)

5. Toxin. (Speaker to be announced later)

BOOKS AND REPORTS

Bacteriological Atlas—*A Series of Coloured Plates Illustrating the Morphological Characters of Pathogenic Micro-Organisms—By Richard Muir, Demonstrator of Pathological and Bacteriological Methods in the University of Edinburgh. New York: Wm. Wood,* 1927. 134 pp. Price, $4.50.

Very few bacteriologists possess the skill to make beautiful preparations and also to depict them, either in black and white or in colors. Almost all textbooks have a few colored plates. In this *Atlas* we have a series of 60 plates exquisitely done in colors. All the ordinary forms which the student is apt to study are given and the work is quite beyond ordinary criticism. We can think of only two things which might be said, and we mention them as a warning to students rather than as criticisms. Many of the organisms are larger than they will appear to the student with the oil immersion and the eye piece ordinarily recommended; so the student is liable to be disappointed. Plate LX, representing Negri bodies, is not in our judgment made with the best stain, and many of the bodies show no internal structure at all; none of them so clearly as generally obtained by the use of the stains devised by Harris or Williams.

The reproductions are excellent and the *Atlas* can be recommended to students and teachers with confidence. It will doubtless be an aid in the laboratory. M. P. RAVENEL

Aids to Sanitary Science and Law—*By C. F. White, M.B., Ch.B., D.P.H., D.T.M. New York: William Wood,* 1926. 316 pp. Price, $1.50.

A most useful little book intended to give a concise review course to candidates for the English diploma in public health. A vast amount of information is packed into this book and students of public health and others in this country who wish to refresh their memories or have at hand a succinct reference book on hygiene and sanitation will find this work of value. The section on Sanitary Law, comprising 78 pages, refers, of course, merely to the various English regulations and so is of academic interest only to Americans. JAMES A. TOBEY

Social Factors in Medical Progress—*By Bernhard J. Stern, Ph.D. New York: Columbia University Press,* 1927. 136 pp. Price, $2.25.

The object of this study is to determine to what extent and why are changes in culture resisted. Other questions involved are the psychological and sociological factors concerned; the nature of cultural growth, and whether or not particularly gifted individuals are chiefly responsible for progress. The author has selected the field of medicine to furnish the answers to these questions. He concludes that no one factor is responsible, the persistence of habit reactions being found more often than any other; social pressure somes next; rationalizations comparatively infrequently. Among other causes are fear and avoidance of pain, ignorance, conflicts with other phases of culture, economic vested interests, which play a large part, and the mechanical difficulties of diffusing knowledge.

The second part of the book considers biography in medical history, and the part which existing knowledge plays in discoveries, while the last chapter gives a long list of multiple discoveries and inventions in the history of medicine. An extensive and well selected bibliography is appended.

There is much interesting medical history in the book which the author has presented concisely and pleasingly. The only fair criticism which can be made is that he has taken as facts statements from some doubtful authorities, but those who are familiar with medical literature will be able to evaluate the evidence. The book is well printed except that a number of proper names are misspelled. M. P. RAVENEL

Stream Pollution in Wisconsin: *Special Report, State Board of Health, Madison, Wisconsin,* 1927. 328 pp.

This joint report of the Conservation Commission and the State Board of Health presents the results of investigations, river surveys, and researches from July 1, 1925, to December 31, 1926. The work was made possible by an annual appropriation of $10,000 by the 1925 legislature. Sanitary engineers, especially, will

welcome this first report which contains 84 figures, charts or photographs and 60 tables, with considerable descriptive text, and a bibliography.

Experiments and collection of data in regard to the treatment of industrial wastes indicate, among other things, that:

1. Preliminary sedimentation, chemical treatment and aeration at the sewage disposal plant (at Waupum) would yield a satisfactory effluent.

2. The removal of the coagulated solids at a pea cannery was essential to prevent overloading of a local sewage disposal plant.

3. The installation of suitable save-all equipment will economically reduce the waste of paper making material to approximately one-half pound per 1,000 gallons of waste.

Among the river surveys was included the Mississippi river, under the direction of the U. S. Public Health Service. It was concluded that immediate consideration be given to treatment of the sewage from the Metropolitan Area prior to its discharge into the Mississippi River.

IRA V. HISCOCK

The Mind in Disease, Some Conditions Cured by Suggestion—*By M. P. Leahy, B.A.Dub., M.D. London: William Heinemann,* 1926. 178 pp. Price, $2.00.

The material in this book is the result of 17 years' experience. It includes a report of the author's own case which naturally strengthened his belief in the effect of the mind on body conditions. He was a British soldier, was badly wounded at Mons in 1914, and spent the succeeding 10 months in a German prison camp. All attempts to save the wounded leg proved futile, and at the end of 7½ months, amputation in the upper third of the thigh was done. At the time he was in a septic condition and had become accustomed to 2 grains of morphine a day, which only partially relieved his suffering. He was naturally a victim to the use of morphine, suffering from profound depression, insomnia and obstinate constipation. In 1915, a book on hypnotism by Forel of Zurich came into his hands and made a tremendous impression upon him, giving him hope for recovery. He believes that practicing suggestion on himself resulted in his complete cure, both mental and physical.

The first chapter of the book is devoted to the consideration of the mind in its relation to disease, and the proper attitude which should exist between the patient and physician. The rest is made up largely of case histories, and ends with a list of conditions which the author believes can be cured by suggestion.

One does not need to accept all that the author himself believes in order to be very much impressed by his argument. He distinctly disclaims any idea that the mind is omnipotent in disease, and does not in any way propose abandoning the well-known methods of medicine and surgery. He holds that any patient of average intelligence, who possesses a desire to coöperate with his physician, can help himself to cure in a number of diseases.

The book is well printed on light paper and will doubtless be of help to those who suffer from various ailments not dependent on organic disease.

M. P. RAVENEL

Heart and Athletics. Clinical Researches upon the Influence of Athletics upon the Heart—*By Dr. Felix Deutsch and Dr. Emil Kauf. Trans. by Louis M. Warfield, M.D. St. Louis: Mosby,* 1927. 187 pp. Price, $2.50.

This treatise is a badly needed, really scientific study of the effects of different types of athletics on the hearts of those participating. While there were extant previously some statistics on the effect of certain sports on the heart, most of them are valueless, because based on insufficient and unscientific data. This report is based on nearly 5,000 cases of athletes examined in the Vienna Heart Station, both by auscultation and X-ray.

In competitive athletics there is distinct enlargement for some sports. In rowing this amounts to more than one centimeter in 20 per cent of the 150 cases. Greater enlargements are found for the heavier men. The greatest strain is caused by rowing, bicycling, and skiing; while boxing, soccer, and fencing "hardly ever give rise to cardiac enlargement."

Tendency to enlargement runs in families, brothers almost always showing similar changes.

Enlarged hearts usually return to normal after a rest. The enlargement is a dilation, not a hypertrophy. The enlargement is greater for the right side of the heart. Long continued training is likely to cause trouble. "Heart muscle once stretched as the result of exercise, shows a strong tendency to stretch again. An enlarged heart may accomplish more than a normal one provided the distension is within physiological limits. Marked degrees of enlargement of the athlete's heart should not be regarded as harmless."

An excellent study, badly needed. The results are told clearly and illustrated by numerous charts and tables. Any physician or physical educator having contact with those engaged in athletic competition should give this book careful study. CHARLES H. KEENE

A Laboratory Course in General Zoölogy. A guide to the dissection and comparative study of animals—*By H. S. Pratt. Boston: Ginn and Company*, 1927. x+244 pp. Price, $1.72.

This is a revised edition of the author's well-known *Course in Invertebrate Zoölogy* in which has been included the perch and the frog to represent the vertebrates. It is a compact and accurate account of 42 animal types most used in laboratory courses in zoölogy, with detailed directions to be followed in their dissection or microscopical examination. The fly, spider, and tapeworm are included. The inclusion of a laboratory mammal, such as the guinea pig or cat, would have added to its usefulness as a reference work in the public-health laboratory. C. A. KOFOID

Pyorrhoea Alveolaris, *Its Aetiology, Pathology, Symptoms, Sequelae and Treatment*—*By F. St. J. Steadman, D.P.H., L.R.C.P. (Lond.), M.R.C.S., L.D.S. (Eng.). St. Louis: Mosby*, 1927. 263 pp., 42 ills., 36 pl. Price, $9.25.

As the author says, the disease is almost universal, occurring at all ages and affecting all races of mankind. There can be no question that it is becoming increasingly prevalent, and the more civilized the community the more frequent is the disease.

Three types are recognized: "the germ-carbohydrate-stagnation type," the atrophic or "dry" type and "phagedenic gingivitis." The author lays special stress on the first of these, and considers modern diet a prime factor in its production. The cause of the second type is obscure, while the third type is due to the organism described by Vincent, and was frequently seen during the World War under the name of "trench mouth." There are excellent chapters on the pathology, morbid anatomy and bacteriology of the disease. A large section of the book is given to systemic complications, many of which have long been recognized as having some relation to oral sepsis. The most striking part of this section is devoted to the relation of oral sepsis to malignant disease. As the result of painstaking studies and observations, the author has convinced himself that the death rate from cancer will be diminished by a vigorous attack on oral sepsis. There is little question that the curves of the two diseases bear a striking resemblance to each other, and one must acknowledge the force of the many facts and cases which the author has assembled. He has not, in our opinion, demonstrated the cause and effect relation.

The section on preventive treatment is excellent. The author holds that prevention should begin with the expectant mother, proper food being provided for her and tooth disorders corrected. He strongly combats the idea of avoiding operative interference during pregnancy. Stress is laid upon properly shaped nipples for artificial feeding, and diets are given.

The early stages of the disease, in which the gingival margin only is affected, are curable, but when the bone has become involved, extraction is the only remedy. Great stress is laid on the proper use of the teeth in chewing, and striking colored plates show well marked disease on one side of the mouth, which has been unused on account of a cavity with exposed pulp, while the other side is perfectly healthy. A striking feature in this connection is disease around the root of an unopposed tooth. Relief of overcrowding and cleanliness, combined with the use of proper foods, are the chief preventive measures recommended.

The book can be thoroughly commended to dentists and physicians alike. The make-up and printing are excellent. M. P. RAVENEL

American Agricultural Villages—*By Edmund de S. Brunner, Gwendolyn S. Hughes and Marjorie Patten. New York: Doran*, 1927. 326 pp. Price, $3.50.

In two years ending in May, 1925, the Institute of Social and Religious Research surveyed 140 villages, with an average population of 1,340, in 28 states, most of them east of the Mississippi River. "There was no well-integrated plan for caring for public health in the villages studied."

The exodus of physicians was continuing. In each of 14 villages some physician had just left or was about to leave. Twenty-three villages had no dentists and 70 lacked nurses.

"The governments of these villages manifested complete lack of concern about public health. Yet 70 villages had the service of public health nurses of one kind or another." In such villages "other features of a modern health program seem more apt to flourish: in

particular, regular health examination of school children and the organization or securing of clinics of various sorts."

This study indicates "that the best results were obtained when state and county health boards were coöperating." The most important solution the authors propose is the establishment of county health units, of which some 300 already exist in the United States.

Of particular interest to public health workers are the findings recorded in Chapter VIII, "Public Health in Villages." This throws valuable light on the most neglected half of the health problem on this continent.

W. W. PETER

Medical Care of Industrial Workers—*National Industrial Conference Board, Inc., 247 Park Ave., New York, N. Y.*, 1926. 112 pp. Price, $2.00.

This is the most recent volume in the series of which there has already appeared *Health Service in Industry*, *The Cost of Health Service in Industry*, *The Physician in Industry*, and *The Relation of Medicine to Industry*. This whole series is invaluable to one interested in industrial medicine, surgery and hygiene.

The present volume notes the recognition given by the major industries to the industrial physician and the medical department and attempts a general survey and summary of the organization, the methods, and the accomplishments up to date. The information contained is based upon that obtained principally from questionnaires from 501 establishments employing over a million workers in many lines of industry. Also the experience of the members of the Conference Board of Physicians in Industry, organized in 1914, has been utilized. The present report is the result of investigations headed by Dr. F. L. Rector, at that time with the Conference Board of Physicians in Industry, and now Editor of the *Nation's Health*.

The work contains 20 tables, 5 appendices, with bibliographic references placed at the foot of the given page concerned.

Apparently little thought is given to the value of medical research in the industrial establishment. On the other hand a commendable feature is the desire to keep together medical activities with preventive medicine, hygiene and sanitation, sometimes called "extra-medical activities."

Many examples are cited for the general statements made. The value of health and energy conservation are both well stressed. The fact that a large amount of information has been comprehended within a few pages adds to the value of the work in this busy day of large compends.

EMERY R. HAYHURST

Handbuch der Tropenkrankheiten—*Herausgegeben von Prof. D. Carl Mense (3rd ed.). Leipzig: Verlag von J. A. Barth*, 1926. Vol. 4, xii + 762 pp., 29 pls. (11 in color), and 199 figs. Price, 70 gold marks.

The contents of the fourth volume of this monumental work on tropical medicine are of prime interest to public health workers in all climates because of the fact that much of its material deals with diseases by no means restricted to the tropics. This is especially true of amebiasis and its complications, an infection of constantly increasing significance in temperate climates. The opening section of this volume, by Professor Manteufel of Berlin, deals with the important cosmopolitan diseases as they develop under tropical conditions. In this section especial note is made of typhoid and paratyphoid fevers, and smallpox (including alastrim). The observations of Carini on the epidemic of alastrim in Brazil in which the mortality steadily rose from 2 per cent in 1912 till it reached 14.4 in Sao Paula two and one-half years later, a virulence comparable with that of variola vera, leads him to regard this only as a mild smallpox. Ribas and others regard alastrim as derived from Africa and identical with amaas or milkpox of African natives, and Mayer believes it to be identical with the windpox of East Africa.

In the discussion of the avoidance of typhoid in the tropics the obstacles noted are the absence or uncertainty of protected water supplies, the difficulty of eliminating typhoid carriers among the servants and food handlers, and the omnipresent fly plague, as well as that of ants, some of which are strongly attracted by urine.

Contact infection, direct and indirect is cited as the main factor evident in the analysis of epidemics of bacillary dysentery.

Amebic dysentery is treated without discussion of the chronic phases. Other chapters deal with nervous ailments; the brief fevers of unknown etiology, dengue, pappetasi disease, Weil's disease, and kala azar. An extensive discussion of liver abscess, lung abscess, and other forms of tissue invasion by amebae is given by Dr. Justi.

The high standards of the previous editions and of the earlier volumes of this one, are maintained.

C. A. KOFOID

Medical Science for Everyday Use—*By Shields Warren, A.B., M.D., Pathologist, Palmer Memorial Hospital, Boston, Mass. Philadelphia: Lea & Febiger*, 1927. 178 pp. Price, $2.00.

The foundation upon which this little book has been built was a series of articles on medical subjects published in the *Sunday Herald* of Boston. Certain of these articles have been selected, revised and rewritten.

The titles of the chapters are all matters of interest. The text itself is up to date, scientifically accurate and written in language which the average layman can understand. The book is necessarily somewhat "spotty," as there is no connection between the various articles, and it is incomplete. As far as it goes it can be recommended.

M. P. RAVENEL

Der Arzt und seine Sendung. Gedanken eines Ketzers—*von Erwin Liek, Danzig. Fünfte Auflage. J. F. Lehmann's Verlag, München*, 1927. 182 pp. Price, 4 marks, bound 5 marks.

Twenty thousand copies of this booklet have been published and a 5th edition reached. Its popularity arises in part from its fearless discussion of the difficulties and shortcomings of medical practitioners by one of their own number.

The writer makes a sharp distinction between the physician whose mission is to help and to heal and the "mediziner." The science, technic, knowledge and skill of the latter are no substitute for personality and service to the individual patient, which is the aim of the former. There is here a caustic analysis of quackery and near-quackery. The author expresses the opinion that its prevalence (almost 50 per cent) in Germany to-day in the face of the growth of scientific medicine is due to the decline of the physician and the increase of the "mediziner" within the profession. He disapproves of attempts to establish confidence in the physician by outlawing the quack. The book has a severe arraignment of mechanistic surgery, and of health insurance and mass practice, which are held to be deteriorating alike to effort, health and thrift. The author also tilts at the State Health Week with some scathing comparisons with conditions in the United States as revealed by a widely advertised American novelist. Cancer publicity education comes in for condemnation as producing cancer-frightened neurasthenics. Perhaps all will agree that the type of health education condemned may deserve the treatment the author gives it. That all health education and all social and coöperative experiments in preventive and community medical developments are tarred alike with the stick of insincerity, buncombe and dry rot, may not follow from the writer's statements, or even his experiences with these movements under post-war conditions in Germany. The ideas discussed in this stimulating brochure will furnish much food for thought for those who are questioning how far our own highly endowed, munificently equipped, and heavily staffed medical schools are meeting, or are aiming to meet the personal, social, and community needs of our own country. The book is a plea for *noblesse oblige* on the part of the medical profession, but the author has not expanded his outlook to include the needs of the community as such.

C. A. KOFOID

Evolution and Genetics—*By Thomas Hunt Morgan. Princeton: Princeton University Press*, 1925. 211 pp., 77 figs. Price, $2.00.

This is the revised edition of the author's *Critique of the Theory of Evolution*, given as the Vanuxem Lectures at Princeton University in 1915–16. Advances in the field of the experimental study of genetics make possible a number of additions and expansions. Included in these are a discussion of the sources of variability, environmental versus racial, a new chapter on the non-inheritance of acquired characters, and another, a criticism of the evidences for human inheritance. In the latter one will find a clarification of the respective relations of nature and of nurture in human racial differences. Vital statisticians and public health workers will find this work brief, lucid, authoritative and illumining on the basic principles of heredity, and some much needed words of caution on conclusions and applications in human social affairs unwarranted in our present knowledge.

C. A. KOFOID

Hydrogen Ion Concentration of the Blood in Health and Disease—*By J. Harold Austin and Glenn E. Cullen. Medicine Monographs: VIII. Baltimore: Williams and Wilkins*, 1926. 75 pp. Price, $2.00.

This book is written by men expert in their subject. Though brief it is concise and summarizes material not collected elsewhere. The contributions on the significance of hydrogen ion concentration have recently been numerous and important. Following the pioneer work of Henderson and Sörensen upon its fundamental

aspects in physical chemistry and physiology, the material has rapidly been applied to clinical problems with great success.

The exposition is simple and lucid and though technical should be readily comprehensible and generally useful. References to the recent literature are adequate without being voluminous. The part on the determination of pH is, properly, not a long exposition of technic, but makes clear the applications to medical problems. The main part of the book is too short a description of pH in normal physiology and a brief summary of the data upon pH in those diseases in which the acid-base equilibrium of the body has been altered.

The authors have brought the subject well up to the date of publication by the introduction of the concept of "activity," the quinhydrone electrode, the effect of pH on calcium ionization and the effect of temperature on pH measurements. It is hoped that the authors will enlarge the book in a subsequent edition.

ALFRED T. SHOHL

Sex and The Young—*By Marie Carmichael Stopes. New York: Putnam,* 1926. 244 pp. Price, $2.00.

This volume by the author of *Married Love* and *Radiant Motherhood* contains little that is new in the field of sex education. Some points which have long been acknowledged as basic by experienced educators are advanced as though they were virtually new discoveries. For example, the belief that sex education in schools should not be given the undue emphasis occasioned by treating it as a special subject in the curriculum seems hardly so startling as to justify the use of italics, capitals, and exclamation marks in advancing it.

Whether or not the word "erogamic" will ever acquire the wide use that the writer hopes for it is extremely doubtful. Many will agree with her wish to gain for the beauties of sex a finer and keener appreciation, but it will require far more than a coined word to achieve this end.

Some readers (as did the reviewer) will tire of the constant references to passages and chapters in others of the author's books. When often repeated, these savor too much of the advertising on a publisher's blurb. Nor does the multiplicity of "I's" and "my's" serve to make for the mental harmony of a searching reader.

Despite these drawbacks there is much in the book which many parents and educators find of value, but we believe they will find material of far greater worth in volumes by Bigelow, Gruenberg, Royden, Galloway, Exner, Gray and others.

RAY H. EVERETT

Practical Methods in the Diagnosis and Treatment of Venereal Diseases—*By David Lees. Wm. Wood,* 1927. 605 pp. Price, $5.00.

Rather more than half of this volume is devoted to a consideration of syphilis in its various phases. The subject is covered in a very practical manner and has a number of excellent illustrations. It is most heartily commended to the general practitioner as a means of familiarizing himself with the best modern thought on the diagnosis and treatment of these diseases.

The chapters on gonorrhea have rather less to recommend them. The author evidently has more confidence in the value of drugs, both internally and locally, than most writers on the subject. There is a short chapter on gonorrhea in children, another on the same disease in women and also a chapter on gonorrheal infection of the eye.

The chapters on syphilis are far and away the best part of the book and they alone are well worth the price to physicians treating patients.

The health worker will be interested in the thoughts of the author upon the patient, the instruction of the patient, and the determination of the patient's freedom from disease. They are in accord with best American practice and are for all practical purposes identical with the findings of the All-American Conference on Venereal Disease of some years back and the criteria of cure issued by various sources since that time.

ALEC THOMSON

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Fall River, Mass.—The third annual report of the Fall River Maternal and Child Welfare Commission for 1926 contains, in the space of 19 pages, much information for those interested in welfare work. The object of the Commission is: (1) To reduce the death rate of babies, particularly of infants under one month; (2) To reduce the number of stillbirths and miscarriages; (3) To prevent maternal deaths; (4) To prevent illness and promote health among babies and mothers. The method used is that of teaching the need of prenatal care, the importance of breast feeding, and the value of medical supervision of well babies. The work of this department is evaluated by comparing its various phases with standards set forth in Section E (Health of the Child up to School age) of *The Appraisal Form for City Health Work*, published by the American Public Health Association. A statistical report of prenatal and child welfare work, together with the number of home visits of all kinds (total 43,333) and the expenditures for 1926 conclude the report.

Cambridge, Mass.—In a 74-page report the health officer of Cambridge gives the following statistics for the year 1926 in this city of 121,887 people: general death rate 12.15 per 1,000 population, infant mortality rate 56.20 per 1,000 live births, birth rate 28.03 per 1,000 population. The major causes of death were heart 218, pneumonia 168, cancer 159, cerebral hemorrhage 137, and arteriosclerosis 126. Considerable progress has been made in the control of diphtheria as is evidenced by the fall in the morbidity rate, 51 cases being reported in 1926 as compared with 487 in 1917 and 168 in 1925. In January the new laboratory at the City Hall replaced the one built 40 years ago, and a full-time laboratory technician is now employed.

In 1926 the State Clinic conducted a survey of all school children in Cambridge as part of the State Ten-Year Program. Of the 18,187 children weighed and examined, 2,274 (12.5 per cent) were classified as in the selective group, and 1,650 of these were given a more complete examination, with the result that 37 (2.2 per cent) were diagnosed as hilum tuberculosis, 4 as latent hilum, and 72 (4.4 per cent) as suspects. Each year a physical examination is given by the school physicians to every child in the first, fourth, and eighth grades, and children in other grades are inspected by the school nurse who reports any defects to the school physicians. If defects are found, the parents are notified and nurses go into the homes to see that the defects are remedied. The number of school physicians' examinations totaled 11,286, home visits by nurses (follow-up work) 5,385, dispensary visits 1,147, and the school nurses made 137,083 routine monthly inspections.

Three Rivers, Can.—For 1926 the city of Three Rivers, Canada, with a population of 32,873, reports a total expenditure through the Health Service of $10,806, which represents 33 cents per capita. A birth rate of 36.7 and a death rate of 15.1 per 1,000 population are recorded. Two hundred and ten children under one year of age died during 1926, making an infant mortality rate of 173.7 per 1,000 births. Graphs showing the general mortality per 1,000 population, the infant mortality from all causes, from gastro-enteritis, and deaths from tuberculosis per 100,000 population add interest to the report.

An educational milk campaign carried on among the distributors of milk to creameries brought about improvements in the cow barns and dairies, and resulted in the tuberculin testing of nearly all dairy herds. Seventy-two per cent of the city's milk supply is pasteurized. The health officer concludes his report with recommendations for the future establishment of a hospital for contagious diseases, the organization of an analytical laboratory, the inauguration and encouragement of immunization of children against diphtheria, and an amendment to the by-law concerning the sale of milk whereby pasteurization will be supervised, tuberculin testing made compulsory, and a satisfactory degree for the cooling of milk assured.

Haverhill, Mass.—The city of Haverhill has published its 1926 annual report, bound in grey paper covers and containing 57 pages primarily of statistical material. The principal facts show a death rate of 13.48 and a birth rate of 21.15 per 1,000 population in this city of 48,125 people. An infant mortality rate of 55 per 1,000 births is recorded. The total number of deaths for 1926 was 649, the average age of the dece-

dents being 53 years 6 months. The per capita expense for 1926 was $1.36, an increase of $.69 over 1924. This increase is due mainly to the cost of hospitalization of tuberculosis patients at the county sanatorium now assumed by the city.

Attleboro, Mass.—The city of Attleboro, with an estimated population of 20,801 for 1926, reports a death rate of 12.4 per 1,000 inhabitants and an infant mortality rate, based on 519 live births, of 48.1. Approximately 7,000 people attended the second Health Show held for two days and evenings in April. The health department put on an attractive and interesting symposium on public health, including instructive talks by health authorities and moving pictures on health subjects. In addition, the school children gave health plays, health literature was distributed, and clinics on child welfare, dental hygiene, tuberculosis, and diphtheria prevention in actual operation demonstrated how this work of health conservation is being done in the community.

The Attleboro Health Camp opened with 40 of the city's most undernourished boys, ranging in age from 7 to 14 years. Individual and group photographs of the boys taken on admission and on discharge tell the story of the gains in weight and general health. The minimum gain for the 6 weeks was 2½ pounds and the maximum gain 12¼ pounds. The average gain in weight was 7.28 pounds; in height one-half inch. The last 13 pages of this 27-page report are devoted to statistical material and to reports of the various health inspectors.

New Zealand—New Zealand's department of health report for the year ended March 31, 1927, is bound, as in previous years, in dark gray paper covers, with a front cover well arranged as to type, seal, and general make-up. The report is printed on soft paper of good quality, size 8½ x 13½ inches. Statistical tables, giving information for several previous years, are used as a basis of discussion of several interesting problems, including infant and maternal mortality and communicable disease control.

A maternal mortality rate of 4.25 per 1,000 live births represents a decline of 0.89 since 1922. The initiation of intensive activities on behalf of expectant mothers and subsequent establishment of ante-natal clinics and closer supervision of maternity hospitals has doubtless been of value. An infant mortality rate of 39.76, in comparison with 39.9 in 1925, is noteworthy.

Mount McGregor Sanatorium—The twelfth annual report of the Mount McGregor Sanatorium of the Metropolitan Life Insurance Company shows that more patients were admitted during the year 1926 than at any previous time. A total of 491 patients were received from the United States and Canada, while 487 were discharged. Of those admitted, 148 were tuberculous and 343 non-tuberculous. Of those discharged 153 were tuberculous and 334 non-tuberculous. During the 13 years of the institution, 4,448 patients have been treated, of whom 2,020 were tuberculous.

The number of suspects admitted is gradually being reduced with increased precision in diagnosis. In 1926 admissions were classified as follows: suspected, 8.8 per cent; incipient, 37.2 per cent; moderately advanced, 32.4 per cent; far advanced, 19.6 per cent; non-pulmonary, 2.0 per cent. The increase in percentage of incipient cases admitted is a commendable sign of progress. Eighty-four and nine-tenths per cent of the incipient cases discharged in the period from 1921 to 1925 were at work December 31, 1925.

Springfield, Mass.—The forty-fifth annual health report of Springfield for 1926, printed on glazed paper and bound in attractive green paper covers, contains the most important features of the year's work. The first three pages are devoted to the organization of the health department which is made up of 14 different divisions, each with its special function. Based on an estimated population of 145,314, the gross mortality rate for the year was 12.52, the birth rate 24.15, and the infant mortality rate 1.58 per 1,000 population.

The number of cases of measles reached epidemic proportions in 1926, 2,156 cases having been reported, of which 2,134 appeared during the first six months of the year. During the year, 1,596 special investigations, visits and inspections were made by the health department nurse to contagious disease patients, schools, hospitals, infant boarding houses, beauty parlors, etc.

Malnutrition is receiving special attention in the schools, where 25 nutrition classes with 1,603 children of from 8 to 10 pounds underweight operate under the general direction of the child welfare nurse. Five dental clinics, located near schools, are now in operation throughout the city where the work at present is directed chiefly to children in the 3 lower grades.

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RAYMOND S. PATTERSON, PH.D.

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PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Measuring **Municipal Government**—Dr. Clarence E. Ridley, in publication number four issued by the Municipal Administration Service of New York City and the School Citizenship and Public Affairs of Syracuse, suggests standards for measuring the results of fire, health, police and public works departments.

In the public health field, after reviewing the Appraisal Forms developed by the State Health Departments of New York and Pennsylvania, the Wisconsin schedule and the presentations of Chapin, Schneider and others, the author settles down to a critical review of the *Appraisal Form for City Health Work* developed by the American Public Health Association.

The author aims at the establishment of certain criteria based upon the results that should follow an effective performance. As morbidity figures are unavailable he has turned to the death records as a source of information, appreciating the fact that even these are not always accurate. Believing that the crude death rate is of little value until it has been analyzed, the general rate has been broken up into its constituent parts and only those causes are included which indicate significant activities. Five activities have been chosen into which the various causes of death have been fitted, as given in the following table:

I. Communicable disease control
- 1. Typhoid fever (4)
- 6. Smallpox (4)
- 7. Measles (1)
- 8. Scarlet fever (2)
- 9. Whooping cough (1)
- 10. Diphtheria (4)
- 22. Infantile paralysis (1)
- 24. Meningitis (1)
- 11, 100 and 101. Influenza and pneumonia (1)

II. Venereal disease control
- All causes (under 1 year), 22%
- 38. Syphilis (1 year and over), 100%
- 72. Locomotor ataxia (1 year and over), 100%
- 73. Other diseases of the spinal cord (1 year and over), 53%
- 74A. Cerebral hemorrhage, apoplexy (25–54 years), 81%
- 75. Paralysis without specified cause (1 year and over), 17%
- 76. General paralysis of the insane (1 year and over), 100%
- 78. Epilepsy (1 year and over), 30%
- 83. Softening of the brain (1 year and over), 35%
- 84. Other diseases of the nervous system (1 year and over), 30%
- 90. Other diseases of the heart (30–59 years), 29%
- 91. Diseases of the arteries, etc. (1 year and over), 54%
- 100A. Bronchopneumonia (1 year and over), 30%

III. Tuberculosis control
- 31–37 incl. All forms of tuberculosis (2)

IV. Health of the child
- Infant mortality rate (5)
- Diarrhea and enteritis (up to 20 years) (4)
- Stillbirth rate (1)

Children's communicable diseases
- 7. Measles (1)
- 8. Scarlet fever (2)
- 9. Diphtheria (4)
- 10. Whooping cough (1)
- 22. Infantile paralysis (1)
- 24. Meningitis (1)

V. Sanitation
- 1. Typhoid fever (4)
- 31–37 incl. Tuberculosis (1)
- 113 and 114. Diarrhea and enteritis (4)
- 5. Malaria (4)

According to Ridley the figures following the causes of death represent an arbitrary opinion of a "Composite Factor" which weighs the cause of death on the following bases: deaths due to the particular cause; cost of prevention communicability; and preventability in so far as same may be chargeable to the public health activities.

After making certain adjustments so as to permit of a comparison his method is reviewed in terms of the American Public Health Association appraisal for certain cities. He finds correlation between performance in accordance with sound health principles and results measured by criteria based on certain mortality rates. The accompanying table shows a comparison of the American Public Health Association values of the mortality rate criteria values (expressed in per cent of totals) and one is led to the conclusion that the two plans of scoring bear a close relationship. The American Public Health Association values have been adjusted so as to fit into the five activities chosen by Dr. Ridley.

	A.P.H.A. Values	Mortality Rate Criteria Values
I. Communicable disease control	20.6	18.6
II. Venereal disease control	5.9	5.1
III. Tuberculosis control	11.8	12.0
IV. Health of the child	41.1	46.3
V. Sanitation	20.6	18.0
	100.0	100.0

Diphtheria Protection in Marquette—Dr. L. L. Youngquist, Health Officer of Marquette, Michigan, reports some interesting figures for his community showing the downward trend of diphtheria incidence following the general use of toxin-antitoxin. His figures are given in the *Monthly Bulletin* of the Michigan Department of Health for October, 1927.

1923—40 cases of diphtheria—4 deaths
1924—20 cases of diphtheria—1 death
1925— 6 cases of diphtheria—1 death
1926— 5 cases of diphtheria—0 deaths

The campaign of immunization was started in October, 1924. In the six cases of diphtheria which occurred in the year 1925 not a single case had received any toxin-antitoxin. Likewise, of the five cases reported in 1926, in no instance had toxin-antitoxin been given, and three of the five cases were among nonresidents.

Reporting Cancer in Massachusetts—Cancer cases are voluntarily reported by the medical profession in Newton, Mass. The Newton Medical Club has voted to report cancer cases to the local board of health.

In the first seven months of morbidity reporting, 30 cancer cases in residents, and 12 cases in non-residents, were reported to the local board of health. During this period there were 29 deaths from cancer among residents, of which only 5 had been reported, a ratio of 1 to 6. If the same ratio applies to the cancer cases as to cancer deaths, there were in Newton during this period about 175 cases. This figure is fairly close to the one obtained when an attempt was made to estimate the number of living patients from the cancer mortality records.

Public Health Reports for September 23, 1927, contain a summary of the work in Newton instituted largely through the energy of Dr. Francis George Curtis, Chairman of the Board of Health of Newton, and Dr. Geo. H. Bigelow, State Commissioner of Health, Boston. A sample of the cancer morbidity report form is included.

Diphtheria Prevention in Hamilton—In a radio talk given by Dr. James Roberts, Medical Officer of Health of Hamilton, Ontario, on October 11, some striking figures were presented showing the reduction in cases and deaths from diphtheria following the institution of a program of immunization.

In the 5-year period from 1915 to 1919 there were 1,001 cases of diphtheria in Hamilton with 116 deaths. For the 5 years from 1920 to 1924 the number of cases rose, with the rise in population, to 2,833 with 175 deaths.

In 1922 the health department commenced its campaign for the immunization of all children that could be reached through the medium of the schools, child welfare clinics, publicity by means of home visits by the department's nurses, by press articles and posters. As a result, some 5,000 preschool children and 13,000 school children were immunized by the department's physicians, added to which, immunization by private physicians would probably bring the total to some 20,000.

The astonishing decrease in diphtheria during the three years from 1925 to 1927, there being 363 cases with only 18 deaths, is the result of this vigorous campaign and has surpassed the fondest dreams. During the period from November 1, 1926, to September 30, 1927, only 10 cases of diphtheria were reported, with 1 death, which very probably was from septic sore throat, as the germ of diphtheria was not found.

Health Officers' Section—Remarks by James Roberts, M.D., Chairman, at the opening of the Health Officers' Section, 56th Annual Meeting of the American Public Health Association at Cincinnati, O., October 17, 1927:

My first duty is to thank you for the honor you have conferred upon me in electing me your Chairman. When I attended the first American Health Congress, a year ago last May, I was only too painfully reminded of the changes which are almost imperceptibly brought about by the lapse of time. With the exception of my good friend Dr. Rawlings I could not remember that a single one of the hundreds who were in evidence at the Congress had been present at the 1907 meeting of this Association in Atlantic City where I first became a member.

The formation of a Health Officers' section by a partial inclusion of those who were formerly attached to the Section on Public Health Administration has been accomplished, and thanks to the industry and devotion to duty of your Section Council during the whole of last evening until midnight, the list of eligibles has been gone over and is pretty well complete.

There is a feeling in some quarters, it is alleged, that the action taken by the Health Officers is the outcome of a desire to be exclusive, "cliquey" and dominating, and of a tendency to refuse to play if they cannot control. I think I can safely say that there is no founda-

tion in fact for such a conception of the position of the Health Officers. My answer to the alleged accusation would be the same as that which was one time given by Dr. Ball of New York, the celebrated specialist on diseases of the lower bowel. He was then in the city of Omaha and was sauntering around the rotunda of the hotel at which a convention of nose and throat specialists had its headquarters, and in the act of puffing away complacently at a good cigar was accosted by one of the delegates and asked if he was a specialist on the nose. "Far from it," said Dr. Ball, and walked away. As a matter of fact the feeling of the Health Officers with regard to the professors and teachers of public health in our universities, the directors of non-official and semi-official health agencies and others who have hitherto been able to obtain membership in our section, is not one of superiority or disdain, but rather something akin to the feeling of the villagers in Sweet Auburn toward the schoolmaster in that sweetest poem in our language by Goldsmith, "And still they gazed and still the wonder grew that one small head could carry all he knew." In justice to those of the present section who were active in its formation and constitution, let me say that it was neither a feeling of superiority nor an inferiority complex which brought about a desire that there should be definite and distinct qualification for membership in the section.

Perhaps I might, to illustrate our viewpoint, slightly paraphrase the celebrated soliloquy of Shakespeare. The official Health Officer feels that it is he who bears the whips and scorns of the general public, the restrictions and oppressions heaped upon him by auditors and treasurers and the contumely of politicians and professional vote-catchers. This being the case he welcomes the opportunity of being once a year in secret conclave with his "fellows" in "tribulation," and of being able to pour out his woes upon sympathetic and attentive ears, of talking, laughing, it may be sometimes swearing, about the ills he finds he has to endure rather than to fly to others that he knows not of.

Having made by way of introduction and explanation this brief apology in extenuation of the action of the Health Officers last year, I would like to signify my pleasure at the goodly number in attendance upon the first session of the new section and to say that out of this orgy of scientific material which constitutes the Fifty-sixth Annual Session of the American Public Health Association, we hope we have selected a few items for the Health Officers' program, the discussion of which will be found useful and helpful in our work.

Sickness Census in Montreal—Dr. Lee K. Frankel and Dr. Louis I. Dublin of the Metropolitan Life Insurance Company have published a report of a sickness census taken in Montreal during the month of December, 1926. A survey was made by the French Health Center of Montreal in Sacred Heart and St. Catherine Parishes—districts inhabited by people of French extraction. The survey was made by nurses. Most of the previous surveys by the Metropolitan Life Insurance Company have been made by agents.

The nurses visited 4,394 households containing 18,955 persons of both sexes and of every age. The average family in these two parishes consisted of 4.31 persons. A total of 1,083 cases of illness was reported of which number 495 were serious enough to involve disability to work. Therefore, 2.6 per cent of the people were seriously sick at that moment.

There was no unusual epidemic condition in Montreal at the time of the survey. Of all the sick, 48.3 per cent had been disabled for one year or longer. This is a much larger proportion than was found in the earlier surveys (28.1 per cent). The services of a physician were employed in 374 cases out of the total 495, that is, in 76 per cent.

LABORATORY

C. C. Young

INFLUENCE OF BILE AND BRILLIANT GREEN ON RATE OF GROWTH OF COLON BACILLI

Harold W. Coles and Max Levine, Fellow A.P.H.A.
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NUMEROUS attempts have been made to develop a satisfactory and dependable presumptive test for the colon group. In 1906, Jackson[4] suggested the employment of fresh bile to which had been added 1.0 per cent lactose, but the addition of peptone was soon found desirable, in order to eliminate the marked inhibition of some members of the colon group.

Jordan[5] (1913), Creel[1] (1914), and others reported that this modified bile medium was still markedly inhibitory to many colon strains and in the *Standard Methods for the Examination of Water and Sewage, Third Edition,* published by the A.P.H.A., lactose bile was dropped in favor of lactose broth for the preliminary enrichment and presumptive tests.

The reduction of the concentration of bile has frequently been suggested. Hale (1916) reported better results with 5 per cent bile than with the standard lactose broth. Salter[10] (1920), and Levine[7] (1922) reported that low concentrations may distinctly stimulate, whereas large quantities were markedly inhibitory to the growth of members of the colon group. Less than 0.5 per cent bile salts or 5.0 per cent evaporated bile were stimulating, whereas 1.0 per cent bile salts or 10.0 per cent dried bile were markedly inhibitory.

In 1920, Muer and Harris[9] suggested the addition of brilliant green to bile, and recommended a concentration of 1–10,000 brilliant green in 5.0 per cent evaporated bile, to which were added 1.0 per cent peptone and 1.0 per cent lactose. This medium has been found very satisfactory as a presumption test but has been reported as somewhat inhibitory for the colon group.

The following experiments were carried out in connection with the work of Committee No. 1 of the American Water Works Association to ascertain the optimum concentrations of bile and brilliant green for the growth of *Bact. coli.*

EXPERIMENTAL

Technic. Unless otherwise stated, invigorated stock cultures transferred daily in peptone water were employed. Four drops of each of five cultures were added to 100 c.c. of sterile tap water, and the mixture diluted so that 1.0 c.c. contained 1,000 to 10,000 bacteria. Tubes of the test media were brought to the desired temperature (37 degrees C.) in a De Khotinsky water bath and inoculated with 1.00 c.c. of the above diluted mixture of colon strains. (This gave initial counts of about 100 to 1,000 per c.c.) After six hours' incubation, the numbers of bacteria were ascertained by plating on nutrient agar (48 hours at 37 degrees C.), and the rates of multiplication or generation times calculated from the formula

$$G = \frac{t \quad \log 2}{\log. B - \log. A}$$

Where "t" is the time elapsed, "A" the number of bacteria at the beginning, and "B" at the end of time "t."

A. EFFECT OF BILE ON GROWTH OF A MIXTURE OF INVIGORATED BACT. COLI STRAINS

A mixture of five strains was studied as described above. The medium employed consisted of 1.0 per cent Difco peptone and 1.0 per cent lactose with various concentrations of bile. The bile employed was furnished by Mr. Dunham, who collaborated on the work of the committee, and was designated No. 72825. It will be referred to hereafter as bile sample *V*. The results of four experiments are summarized in Table I.

TABLE I

EFFECT OF CONCENTRATION OF BILE (SAMPLE V) ON RATE OF GROWTH OF MIXTURE OF COLI STRAINS

Conc. of Bile, Per Cent	Mixture of 5 Stock Cultures. Generation Time in Minutes	Freshly Isolated Strain from Sewage. Generation Time in Minutes
0.0	28.5	27.3
1.0	25.4	26.4
2.0	25.1	26.0
3.0	27.5	25.6
4.0	29.8	26.2
5.0	31.9	26.5

There was a distinct minimum generation time (maximum rate of growth) with 2.0 per cent bile, whereas 5.0 per cent bile was distinctly inhibitory.

In some observations with a freshly isolated strain from sewage, an optimum was observed at 3.0 per cent bile, and there was also slight stimulation with the 5.0 per cent bile. A concentration of 2.0 per cent bile was always found to be distinctly stimulating, whereas 5.0 per cent was slightly stimulating for some strains but distinctly inhibitory to others.

B. EFFECT OF BILE ON GROWTH OF A STORED MIXTURE OF COLI STRAINS

A mixture of five strains of *Bact. coli* was placed in sterile tap water, and after one and two weeks' storage, the generation time of the surviving bacteria was determined as described above. The results of two experiments for each storage period are shown in Table II. The bile employed was *Sample V*.

The generation times for the stored samples were naturally higher than the fresh cultures but the effect of concentration of bile was similar. In all cases, 2 per cent bile was an optimum concentration, whereas 5.0 per cent showed distinct inhibition.

C. EFFECT OF REACTION OF BILE ON GROWTH OF MIXTURE OF COLI STRAINS

A comparison of three different samples of bile, employing a mixture of the five coli strains as described above showed distinct differences as indicated in Table III. Bile *Sample V* was distinctly inhibitory at 5.0 per cent, while the other bile samples *W* and *X* were stimulating at this concentration. The reactions of the media were as follows: V–pH 6.61, W–pH 7.52 and X–pH 6.98. It appeared that the more acid reaction was inhibitory.

TABLE II

EFFECT OF CONCENTRATION OF BILE (SAMPLE V) ON RATE OF GROWTH OF STORED AND FRESH MIXTURE OF COLI STRAINS

Conc. of Bile in 1 Per Cent	Generation Time (in Minutes)		
	Fresh	Stored 1 Week	Stored 2 Weeks
0.0	28.4	32.8	33.2
1.0	25.6	29.7	31.3
2.0	24.9	29.4	29.3
3.0	27.9	31.8	31.4
4.0	31.8	39.7	40.3
5.0	34.5	42.5	42.0

As the foregoing comparisons were made with different samples of bile, it is possible that factors other than the differences in the observed reactions were responsible for the results obtained. The Digestive Ferments Company which was collaborating in this work was asked to prepare a series of media, using the same sample of bile and other ingredients, but varying the H+ ion concentration. The average results obtained in four series of experiments are shown in Table IV.

TABLE IV

EFFECT OF REACTION OF BILE MEDIA ON GROWTH OF COLI STRAINS
(BILE SAMPLE "Y" No. 4526)

With 5 Per Cent Bile		Without Bile	
pH	Generation Time	pH	Generation Time
6.0	30.0	6.1	29.1
7.3	25.6	7.2	29.6
7.8	25.4	7.9	34.6

Comparing peptone lactose with peptone lactose bile at the same reactions, it will be seen that at pH 6.0 to 6.1 the addition of bile was slightly inhibitory, whereas at pH 7.2 to 7.9 it was distinctly stimulating to growth. In the peptone lactose medium an acid reaction (pH 6.1) was optimum, while in the bile medium an alkaline reaction (pH 7.3–7.8) was best for growth. The results indicate that if the reaction is adjusted to a pH of about 7.4 to 7.5 a concentration of 5.0 per cent dried bile was stimulating and not inhibitory.

D. EFFECT OF BILE AND BRILLIANT GREEN ON RATE OF GROWTH OF A MIXTURE OF COLI STRAINS

A number of experiments were performed with a medium containing 1.0 per cent peptone,

TABLE III

EFFECT OF VARIOUS SAMPLES OF BILE ON GROWTH OF COLI STRAINS

Per Cent Bile Concentration	0	2	5	2	5
Bile Sample	Generation Time (Min.)			Reaction (pH)	
72825 (V)	30.8	26.6	33.2	6.66	6.61
22226 (X)	28.6	25.9	26.2	7.24	6.98
112725 (W)	32.2	25.4	26.7	7.12	7.52

TABLE V

EFFECT OF CONCENTRATION OF BRILLIANT GREEN ON RATE OF GROWTH OF A MIXTURE OF COLI STRAINS IN 2.0 PER CENT BILE MEDIA

Conc. of Dye		0	1 5,000	1 7,500	1 10,000	1 12,500	1 15,000	1 20,000	1 50,000	1 75,000	1 100,000	1 250,000	1 500,000
Bile Sample	pH	Generation Time (in Minutes)											
W	7.12	24.4	*	*	258.8	77.7	57.4	....	....	....	....	....	....
W	7.12	25.0	*	*	146.0	59.0	47.2	....	....	....	....	....	....
W	7.12	25.1	....	....	....	....	56.5	28.3	26.0	....	25.2	25.0	....
W	7.12	25.8	....	....	....	....	43.8	32.0	26.4	....	26.9	25.9	....
Average		25.1	*	*	202.4	68.4	51.2	30.2	26.2	....	26.0	25.5	....
V	6.61	27.2	*	....	....	....	....	27.3	27.1	....	26.8	26.6	26.5
V	6.61	26.4	....	....	....	....	....	27.2	25.9	....	25.4	25.4	25.3
Average		26.8	*	*	....	....	....	27.3	26.5	....	26.1	26.0	25.9
X	7.94	24.5	....	....	....	....	27.0	26.3	25.0	24.6	24.7	....	....
X	7.94	27.2	....	....	....	....	29.9	29.0	29.1	28.0	27.3	....	....
X	7.94	25.8	....	....	....	....	28.0	27.6	26.0	26.7	26.1	....	....
X	7.94	26.0	....	....	....	....	27.2	27.1	26.6	26.2	25.9	....	....
Average		25.9	....	....	....	....	28.0	27.5	26.9	26.4	26.0	....	....

* Generation time very high.

1.0 per cent lactose and 2.0 per cent dried bile to which various concentrations of brilliant green were added. Three different samples of bile were employed.

In the presence of 2.0 per cent dried bile *(W)* concentrations of 1–15,000, 1–12,500, and 1–10,000 brilliant green were markedly inhibitory, a generation time of 25.1 minutes being increased to 51.2, 68.4 and 202.4 minutes respectively. In the presence of 1–20,000 of the dye there was some retardation of growth, but concentrations of 1–50,000 or less showed very little or no inhibitory effects.

In Table VI are summarized the results of experiments employing various concentrations of brilliant green in a medium containing 5.0 per cent bile, 1.0 per cent peptone, and 1.0 per cent lactose.

With bile *Sample W*, a concentration of 1–5,000 brilliant green was markedly inhibitory, a generation time of 26.1 minutes rising to 68.2 minutes. With 1–10,000 of the dye, and lower concentrations, there were slight increases in the generation times.

Bile *Samples V* and *X* showed some inhibition of growth in the presence of 1–10,000 brilliant green, generation times of 31.1 and 26.3 minutes rising to 32.8 and 28.0 minutes respectively. Lower concentrations (1–15,000 and 1–20,000) of the dye were less inhibitory, and at 1–25,000 and 1–30,000 brilliant green, the rate of growth was stimulated. A concentration of not over 1–20,000 brilliant green appears to be preferable from the standpoint of reducing loss of colon forms if the 5.0 per cent bile medium is to be employed for preliminary enrichment.

TABLE VI

EFFECT OF CONCENTRATION OF BRILLIANT GREEN ON RATE OF GROWTH OF A MIXTURE OF COLI STRAINS IN 5.0 PER CENT BILE MEDIA

Concen. of Dye		0	1 5,000	1 7,500	1 10,000	1 12,500	1 15,000	1 20,000	1 25,000	1 30,000
Bile Sample	pH	Generation Time (in minutes)								
W	7.52	24.4	70.4	26.4	25.0	25.3	24.6			
W	7.52	26.2	66.0	28.5	27.8	....	26.8			
W	7.52	27.4			29.5		28.7	26.9	27.2	27.5
W	7.52	26.3			26.5		26.5	27.5	26.9	27.4
Average		26.1	68.2	27.5	27.2		26.6	27.2	27.9	27.4
V	6.61	29.6			31.0		30.7	29.5	26.1	26.9
V	6.61	32.5			34.5		33.9	33.2	32.7	29.9
Average		31.1			32.8		32.3	31.4	30.4	28.4
X	6.98	25.0			25.9		25.1	24.8	24.4	24.2
X	6.98	26.2			27.2		26.8	27.1	26.1	25.9
X	6.98	26.0			29.6		28.0	26.8	26.5	25.9
X	6.98	27.7			29.3		29.0	28.7	28.6	28.1
Average		26.3			28.0		27.2	26.9	26.4	26.0

SUMMARY

Evaporated bile may inhibit or stimulate growth of members of the colon group of bacteria, depending on concentration and reaction.

Different samples of bile varied in their inhibitory or stimulating effects. One sample of bile was distinctly inhibitory when employed in 5.0 per cent concentration while another accelerated growth.

With all samples of bile employed, a concentration of 2.0 per cent bile was found to stimulate growth.

In an alkaline reaction (pH 7.3–7.8) 5.0 per cent bile decreased the generation time (stimulated growth) while at pH 6.1 the same sample effected retardation of growth.

The optimum reaction for growth of *Bact. coli* is a function of the composition of the medium. Thus, in peptone lactose media, growth was best at pH 6.1, whereas in peptone lactose bile, optimum growth was obtained at pH 7.3 to 7.8.

The amount of brilliant green giving satisfactory results in bile media was proportional to the bile concentration. With 2.0 per cent evaporated bile concentrations of dye over 1–50,000 were found to be inhibitory. With 5.0 per cent bile, a concentration of 1–20,000 brilliant green gave very good growth.

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VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Vital Statistics of the Metropolitan Life Insurance Company, 1927—The mortality experience of the Metropolitan Life Insurance Company for the first 9 months of 1927 indicates a record health year for the United States and Canada. The death rate among the industrial white policyholders for this period dropped to 8.1 per 1,000. Despite the hundreds of thousands of infants under 1 year of age now insured by the company, this is the lowest general mortality recorded, even in the years when this group, with very high death rates, was not insured. The death rate for more than two and one-quarter million colored policyholders was 14.8 per 1,000, somewhat higher than the minimum colored rate of 13.5 in 1921.

The most important feature in this reduction was the lowering of the tuberculosis death rate among insured white persons to 76.2, a decrease of 40 per cent from the rate of 124.9 in 1920. The death rates for measles, scarlet fever and whooping cough all continued to decline. The diphtheria rate increased a little as compared with 1926, but is nevertheless lower than in all other years. The influenza death rate was less than half that for the corresponding period of 1926 and the mortality from pneumonia also dropped appreciably. The lower prevalence of influenza and pneumonia helped in reducing the mortality of organic heart disease (from 126.6 to 120.2), cerebral hemorrhage and chronic nephritis.

The death rate from diarrheal complaints declined to 22.8 for the white policyholders and 27.8 for the colored, chiefly as a result in the decrease of deaths from this disease, of children under two years. The mortality from childbirth dropped to 14.0 per 100,000 for white policyholders. The cancer death rate among the whites is still high (73.4) and only slightly

lower than for 1926. The cancer death rate among the colored rose from 69.2 for the first nine months of 1926 to 71.6 in the same period of 1927. The death rates from alcoholism and cirrhosis of the liver declined slightly but the mortality from automobile accidents increased 6.8 per cent among the whites and 12.0 per cent among the colored.—*Stat. Bull.*, 8:1–5 (Oct.), 1927.

Heart Disease in Cincinnati—The death rate from organic heart disease in 1926 placed Cincinnati next to the highest among the 16 large American cities. In the past 20 years the death rate has more than doubled, and since 1925 it rose from 244 to 300 per 100,000. This high rate has not been explained but it may be due to the poor housing conditions, the large negro population and the great number of people of advanced age.

There was a sharp rise in the number of deaths from angina pectoris, from 25 in 1917 to 73 in 1926, and from the degenerative diseases which increased from 832 to 1,110 in the same time. Six hundred and ninety-two or 7.2 per cent of the 9,570 patients discharged from the Cincinnati General Hospital were diagnosed as having chronic heart disease. Syphilis was present in 17.2 per cent of the patients with heart disease. Salpingitis, scarlet fever and diphtheria seemed to have little effect on the heart.

The examination of pupils in 9 public schools with a population of 6,960 children showed that approximately 181 or 0.37 per cent had heart disease. This is a much smaller percentage than the 1.5 or 2 per cent given for various eastern cities. Heart disease appeared in only 2.5 per cent and rheumatic fever in 2.8 per cent of the admissions of children to the Cincinnati General Hospital and the Children's Hospital.—Julien E. Benjamin, *Am. Heart J.*, 2:637–648 (Aug.), 1927.

Expectation of Life in England and Wales—The new National Life Table for England and Wales (English Life Table No. 9) confirms the view that the vitality of the nation has been steadily improving, especially at the youngest ages. The probability of a child dying in the first year of life is found to have decreased about 40 per cent in the years between 1906 and 1921. At the age of adolescence, the new rates for males are not very different from those of Table 8 made in 1911. The new rates of mortality for unmarried females between 18 and 27 are appreciably higher than those in the previous table. The vitality of both sexes from 30 to 80 increased considerably but at the advanced ages little progress is shown.

At the youngest ages for which comparison is possible between single, married and widowed women, the lightest rates are those for single women. Between 24 and 37 they differ only slightly for single and married women, but thereafter the rates for married women are usually the lowest. Widows invariably had higher rates than single or married women.

The rate of mortality varies both with the geographical distribution of the people and with the density of population. The difference between the death rate in the county boroughs and in the rural districts is greater among males than among females. This variation seems to be due to the relatively more favorable mortality of the male population in the rural areas, rather than to the greater occupational strain affecting male lives in the county boroughs. The vitality of Greater London approximated fairly closely that of England and Wales, that of the males being slightly inferior and that of the females slightly superior to the general average. The mortality rates of both sexes between 15 and 30 are relatively light, probably because the population of the towns is continuously recruited by the accession of healthy lives from other districts. The probability of a child dying within the first 10 years of life in the rural districts of the eastern counties in only about half of that in the county boroughs of Northumberland and Durham.—National Life Toll for England and Wales, *Med. Off.*, 38:152–156 (Oct. 1), 1927. Ab. of Registrar-General Supplement (England and Wales, 1921, Part I, Life Tables).

Infant Mortality in India—The average infant mortality rate in the whole of India is between 200 to 250 per 1,000. In 1923 the rate is given at 176 although it varied from 592 in Poona to 218 in Karachi. The total deaths for that year were 6,036,931 or 25 per 1,000, but almost one-quarter of them occurred during the first year of life. Almost 50 per cent of the 1,486,277 infant deaths occurred during the first month of life and 65 per cent of these deaths under one month were in the first week. Still-birth figures are not very reliable but probably 2 to 5 per cent of all the babies were born dead. The maternal death rate varied between 5 and 30 per 1,000 in different provinces.

The causes of this high infant mortality are ignorance of the young mothers, lack of trained and adequate care at child birth, disease and faulty physique of the women due to poor food and faulty hygienic conditions. Antenatal care of the infant is of traditional origin in India but the old traditions are dying out and no new methods have yet been introduced into most of the communities.—Rao Bahadur P. V. Shikhare, Is there a Need for an Enquiry into the Causes of Infant Mortality? *Revue Internationale de l'Enfant*, 4:583–593 (Sept.), 1927.

The Vital Statistics of Czechoslovakia—Public health conditions, especially in the eastern provinces of the Czechoslovak Republic, have not improved in the last year. The general death rate for the country in 1926 was 15.6, a slight rise over the lowest rate of the after-war period of 15.0 in 1923. This increase has been caused chiefly by the increasing mortality in the lowest age groups, as shown by the rise in the infant mortality rate from 146.3 in 1925 to 154.3 in 1926. The middle age groups held practically the same rate as in previous years, but an increase occurred in the old age groups.

Whooping cough headed the list of causes of death with 2,886 deaths, a tremendous increase over 1925, when there were only 683 deaths from this disease. There was also an increase in the death rate from measles. The rise in the mortality of the higher age groups is due to the increase in influenza and the inflammatory conditions of the respiratory organs.—*J. A. M. A.*, 89:1442 (Oct. 22), 1927.

Rheumatism in Childhood—Rheumatism seems to be chiefly a disease of poor people and the incidence in direct relation to poverty. From a study made of the economic status of 522 exposed persons in London, rheumatism was found in 6 per cent of the members of families having a margin over the necessities of life, in 9 per cent of the families having no such margin and in 11.9 per cent of those with means generally below the subsistence level. Rheumatism is very rare among children of the poor classes when they are placed in the healthy environment of Poor Law homes—only about 1 per cent of these children were found to be rheumatic according to a study made by the Medical Research Council.

The average age of onset of the disease among 121 rheumatic patients was 8.2 years for families with a margin above the necessities, 7.5 years in those with just enough to live on, and 7.2 years in the families below the subsistence level. About half the number had at some time definite joint pains and in 29 per cent this was associated with swelling and pyrexia.

The heart became definitely involved in 67 per cent of the cases and at least 1 attack of chorea had occurred in 68 per cent of the cases. These attacks of chorea were almost certain to recur among the children in the poorer surroundings. It was noted that whereas the combination of heart disease with rheumatic fever was frequent, it was distinctly uncommon for chorea to occur either during or following an attack of acute rheumatic fever without a previous cardiac involvement. During the course of the disease subcutaneous nodules were present in 15.7 per cent of the cases.—F. J. Benjamin, *Med. Off.*, 38:141–142 (Sept. 24), 1927.

Infant Mortality in Cincinnati, 1925—The infant death rate for the city as a whole was 77. There were 410 still births, and of the 649 deaths during the first year of life the great majority died under two weeks of age.

There was a definite relation between the density of population and the infant mortality, for the rate in the different wards of the city varied from 37 to 157. The density of population was only 17 persons per acre in the 13 wards having an infant death rate lower than the average, but the 13 wards having a higher rate had a density of 61 persons per acre.—Cincinnati *Pub. Health Fed. Bull.*, 7:7–8 (Aug.), 1927.

Public Health in Vienna—There has been a remarkable improvement in the health of Vienna since 1900. Municipal infant welfare work has caused the infant mortality rate to fall from 178 in 1900 and 148 in 1913 to 80 in 1925 and 1926. In spite of the hardships caused by the war and the persistent unemployment of over 15 per cent of the population, the general death rate fell from 16.3 in 1910–1913 and 20.8 from 1913–1918 to 12.2 in 1925. Tuberculosis in 1914 caused 20 per cent of the total deaths, 28 per cent in 1916 and 31 per cent in 1918, but only 15 per cent in 1925. The percentage in 1926 was slightly higher but the systematic campaign against the disease is expected to bring a steady improvement in the mortality.—*Lancet*, 2:626 (Sept. 17), 1927.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C.E.

Sewage Treatment Experiments at Houston, Texas—The earliest sewage treatment experiments with activated sludge in Houston were begun about 1914 and have continued since that time. A number of the interesting fundamentals established through this work are given. It was proved that when the quantity of air supplied was less than 0.2 cu. ft. free air per square foot of water surface per minute that there was a noticeable falling off in the results and when the amount of air per square foot was in excess of 0.25 the improvement was not proportional to the quantity of air supplied. Tanks with a depth of less than 7½', with ordinary agitation would not give the best results. The problem of combating the clogging of the filtros plates, due to iron rust, was solved through the immersing of the plates for a few hours in a 10 per cent solution of hydrochloric acid. It is now believed that the use of concrete holders and dust removers for cleaning the air will give the plates a life of at least five years.

The lagooning of sludge (a form of separate sludge digestion) has not been altogether satisfactory. Methods of sludge dewatering were tried. In 1917 the old process of flotation was employed embodying the use of soda ash and sulphuric acid with application of heat to evolve CO_2. The best results were obtained with 105 lbs. of soda ash and 268 lbs. of sulphuric acid per ton of dry product with temperature of 45° C. The resulting sludge, however, had about 97 per cent water, and obviously such a method was not practical. In 1921 a dewatering plant was put into operation which consisted of three cyprus sludge settling tanks of 50,000 gal. capacity each, two plate and frame filter presses and one direct indirect heat rotary dryer. This plant had a capacity of ten tons of dry sludge per day. Attempts were made to filter the sludge directly as received from the aerating tanks and also after acidification with sulphuric acid and sulphur dioxide gas, the final cost of the product being: Unconditioned sludge, $38.90; conditioned with sulphuric acid, $33.85; conditioned with sulphur dioxide, $39.30. The high cost of operating the filter presses and the short life of the filter cloth have caused the abandonment of the process.

A standard wet machine such as used in the paper industry was installed, but cost of replacement of screens, loss of solids, and nonconsistent results caused the abandonment of this process. More recent experiments using a 4-foot American continuous vacuum filter with aluminum sulphate or ferric salts as conditioning reagents have been tried. Hydrogen ion concentration has been used as a guide for the conditioning process. The optimum pH for filtration with ferric chloride is about 5.4 and with alum sulphate is about 4.8. It is expected to produce a sludge cake containing from 80 to 82 per cent moisture at a cost within economic limits and which can be further dried in the rotary dryer. Experiments in 1926 using a conditioning agent and running the sludge so treated on to drying beds for partial drying were not successful, due to climatic conditions and odors and other nuisances produced before the sludge had time to dry sufficiently to be removed from the beds. Other experiments to prevent the rising of sludge blankets in the settling tanks through the use of chlorine were tried. Experiments on the iron content of sludge have indicated that so far as Houston conditions are concerned the iron content has no effect on purification.

Experiments with very concentrated packing house waste indicate that surface aeration by mechanical apparatus is equal in cost of power to that of diffused air. Standard purification was accomplished by the first method in 36 hours as compared to 12 hours with activated sludge. With normal domestic sewages, however, there may be attained a greater power economy using surface aeration.—W. S. Stanley, *Proceedings of Ninth Texas Water Works Short School*, Texas Sec. Southwest Water Works Assn., pp.288–292. Abstr. Chester Cohen.

Occurrence of **Bacterium Coli of Intestinal Origin on Hands of Food Handlers**—This paper presents the results of an actual investigation made in the public eating places of Waco, Texas, to determine the frequency of the occurrence of *B. coli* of intestinal origin on the hands of food handlers in restaurants, cafes, lunch counters, sandwich shops and soda fountains. The tests used, together with the technical procedures followed, are given in detail. Koser's sodium citrate medium was used for distinguishing the *B. coli* of intestinal origin from that of vegetable origin, since in this medium it appears that the former organisms do not grow while those of non-fecal origin produce a turbidity in the otherwise clear medium.

A total of 337 tests were made on 251 food handlers and the results are tabulated to show the variations among different races, sexes and ages. *B. coli* of intestinal origin were found present on the hands of food handlers while at work in 8.38 per cent of the tests made.—W. A. Buice, H. C. Sehested and R. B. Dienst, *J. Infect. Dis.*, 40:348 (Feb.), 1927. Abstr. W. L. Havens.

Report of a **Typhoid Epidemic in Grafton, West Virginia, Winter of 1926–1927**—In December, 1926, and January, 1927, Grafton, West Virginia, suffered from a typhoid fever epidemic due to polluted drinking water. There were more than 150 cases resulting in 25 deaths. Grafton procures its drinking water from the Tygarts Valley River, and for five years the West Virginia State Health Department has been urging filtration of the water. Little success has been met and it even was necessary to have recourse to the courts to obtain the installation of a chlorinator.

Investigation of this epidemic disclosed that chlorination had not been continuous nor at a high enough rate during the month preceding. As to the cause of the specific pollution of the river, it was found that five cases of typhoid fever had occurred in the late fall of 1926 twenty miles up the river and that the stools of these patients had been thrown on the banks of a small stream leading to the river. Rainfall records indicated that heavy rains had occurred during the second and third weeks of November, the period preceding the time of development of the greatest number of typhoid cases in Grafton by two or three weeks. The five cases up the river were virulent ones and the disposal of the stools on the bank of the stream leading to the river probably caused the disastrous epidemic in Grafton.

As an outcome of this epidemic immediate steps were taken by the municipality to retain a competent engineer to draw plans for a modern filtration plant and the West Virginia legislature was asked to pass a special emergency bill allowing a special levy to be made to finance a construction program.—E. S. Tisdale, *Pub. Health Rep.*, 42:1217 (May 6), 1927.

Separate Sludge Digestion—The method of sewage disposal by separate sludge digestion is briefly discussed in this article and the operation and construction features of two plants in Wisconsin are described.

The city of Hartford built a plant of this type in 1924 and it has given satisfactory service. Sewage first passes through a coarse bar screen and the screenings are removed to the sludge bed. The screened sewage passes to the clarifier where the suspended solids are removed. A Dorr mechanism is used for concentrating the sludge and the thickened sludge is removed daily to a separate tank for digestion. The average detention period in the clarifier is 2¼ hours and the time necessary for pumping sludge is 30 minutes daily.

The digestion tank has a capacity of 3 cubic feet per capita based on an ultimate population of 5,500. This tank, too, is equipped with a Dorr mechanism for breaking up the scum so that gases may escape. The incoming sludge is distributed evenly on the surface by means of a channel riding with the revolving mechanism.

Sludge is removed by static head to a concrete drying bed. The under-drainage system is of tile with brick covering. Over the brick are placed 18 inches of stone and 6 inches of sand. The area of the bed provides a capacity of 0.6 sq. ft. per capita. Official tests conducted by the Wisconsin State Board of Health established the fact that the raw sewage was extremely strong for domestic sewage and that a removal of 73 per cent by weight of the suspended solids was accomplished. Sludge has been withdrawn five times without any complaints from adjacent landholders. The operating cost of this plant was $630 for 1925.

A similar installation was recently completed at the city of Antigo except that provisions were made for securing better operation during cold weather by the addition of a cover for the digestion tank, a gas collector and heating unit for the sludge. The gas is used as fuel for heating the plant and the sludge, and is

equivalent to 200 pounds of coal per day over a nine months' period. The gas maintains a temperature of 65° F. in the digester.

The following advantages of separate sludge digestion are noted: The tanks are shallow and cheaper to build than two story tanks; the mechanism employed in the tank takes the place of hand work; the type of plant is flexible and capacity of either tank can be enlarged without necessity of enlarging both; the elevation of sludge in the digester permits gravity distribution to drying beds; the collection of gas, when burned eliminates odors and conserves fuel in the plant; this type removes the solids as much as others; the mechanical features need supervision and better efficiency is secured than a non-mechanical plant in which supervision is often neglected.—Jerry Donohue, *Am. City*, 36:633 (May), 1927. Abstr. D. W. Evans.

Purification of Skim Milk Solutions on a Lath Filter—"The problem of purifying creamery wastes resolves itself into developing means of destroying milk sugar without acid production." Anaerobic methods of treatment develop inhibitory acidities and disagreeable odors. Activated sludge methods are costly and do not produce entirely satisfactory effluents. For small creameries especially, lath filters seem eminently practical and produce very satisfactory results according to these experiments which extended over a period of three months.

"In these experiments a small lath filter was employed. It consisted of 6 tiers of laths 2 feet square and 1 foot deep with 4 inch spaces between the tiers to permit sampling at the various depths. Various dilutions of skim milk (0.5 to 1.5 per cent) were applied at rates of 1,125,000 and 2,250,000 gallons per acre per day for 10 to 14 hours daily."

Results for the 3 dilutions and 2 rates of filtration: Allowing for mineral solids in the diluent the filter removed from 63–75 per cent of the milk solids principally in the upper 3 feet of the filter. The reduction in oxygen consumed constituents was from 75.1 to 87.3 per cent and the elimination took place largely in upper 3 feet of filter. Ammonification was most marked in the upper layers of the filter. Nitrites rose quickly to a maximum in the third to fifth foot and then decreased. Nitrite formation was markedly retarded by increasing the concentration or rate of filtration. A distinct reduction in nitrates occurred in the first foot of filter and rose rapidly through the rest of the filter. Although based on few data, the observed relationships between concentration of waste, rate of treatment and nitrogen, point to a direct mathematical one. High nitrates were accompanied by high relative stabilities and, with 1 per cent solution, the effluent from the fourth foot of filter gave relative stabilities of 85–90 per cent. Raw wastes were slightly acid (pH 6.6–6.9) and fresh effluents were distinctly alkaline (pH 7.7–7.9). Anaerobic storage of raw wastes for two days at 20° C. increased acidity (pH 6.4–5.2), while effluents on storage remained alkaline (pH 7.4–7.6).

The pamphlet has charts and tables and the appendix contains tables of original data of seven series of experiments.—Max Levine, G. W. Burke and C. S. Linton, *Bull. 81*, Engineering Experiment Sta., Iowa State College, Ames, Iowa, 25:1 (Sept. 29), 1926. Abstr. A. S. Bedell.

Summer and Tourist Camp Sanitation—Camp sanitation is demanding greater attention due to the greatly increasing auto travel. In 35 states there were 3,000 camps having sanitary inspection and it is estimated that these camps were used by 2,000,000 people in the camping season of 1925. It is, therefore, important to establish safe water supplies along highways and in tourist camps to limit the spread of water borne disease. Thirty states have enacted special rules and regulations to govern outdoor camps. In most states special engineers or sanitary inspectors are employed during the summer months to supervise camp sanitation. A decentralized program of coöperation between the state and local officials seems best for handling the administration of the regulations governing camps.

The general specifications for regulations on camp sanitation of several states have a general agreement and include the following points: (1) Definition of a camp; (2) submission of plans and issuance of a permit; (3) safe water supply; (4) safe sewage disposal; (5) sanitary garbage disposal; (6) proper drainage; (7) capable management; (8) penalty clause. Certification of highway and camp water supplies has been found practical and has been taken up by many states.—*Committee Report* presented at Conference of State San. Engrs., June, 1926. *Engr. & Cont.*, 65:436 (Sept.), 1926. Abstr. C. C. Ruchhoft.

Results of Studies at the Omiya Laboratory for Disposal of Night Soil—The portion of

the report appearing in this issue deals principally with the experimental privies and the longevity of typhoid bacilli therein. The object of the studies was to determine the length of time required for total destruction of pathogens in urine-feces mixtures through natural decomposition and to devise a practical privy which would accomplish this end.

Laboratory experiments showed that the longevity of typhoid in excreta varied from six days in mid summer to 40 days in the spring and fall and that some bacilli would live throughout the winter.

Hookworm eggs lived a month during mid summer and five months during the cold season. Round worms were more resistant, living 2 months during the summer period and sometimes found alive after 10 months.

Several types of privies were experimented with, the most successful being a box shaped type having a capacity of 22 cubic feet (capacity 10 persons for three months) with five sections of chambers. The entrance chamber was considerably larger than the others. This type appeared to give better results than where the chambers or sections were of uniform size.—R. Takono and others, *J. Pub. Health Assn. of Japan*, 3:1 (Feb.), 1927. Abstr. R. E. Tarbett.

Practical Sterilization of Milk Bottles by Chemical Disinfection—The best method of chemical disinfection consists of the use of an automatic bottle cleaner with three soaking compartments containing detergent solutions with alkalinities of 4 and 4.5 per cent (as NaOH) in the first two compartments and clean water in the third, at temperatures of 120°, 160° and 120° F. This was timed for a 4-minute exposure and killed all *B. coli* and maintained proper caustic strength of solutions during cleansing of approximately 15,000 milk bottles. From a number of tests it was determined that a 5 per cent solution of NaOH at 100° F. would destroy *B. coli* in 2 minutes. Na_2CO_3 was not as efficient germicidally as NaOH used alone or in combination with Na_2CO_3. Sodium hydroxide does not destroy tubercle bacilli but the temperature of 160° F. for 4 minutes in second compartment destroys those exposed.—Milton E. Parker, *Pub. Health News*, N. J. State Dept. of Health, 11:296 (Nov.), 1926. Abstr. W. W. White.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., AND LEONARD GREENBURG, PH.D

Precautions in the Use of Duco—The occupational poisoning resulting from the use of quick drying finishers including the pyroxylin types has called forth the preparation of this *Bulletin* although but few cases have been actually discovered. The composition of Duco is somewhat less than 50 per cent solids consisting of resins, pigments, flexible oils, and a relatively small amount of nitro-cellulose. The fluid constituents consist of volatile solvents of the alcohol and aromatic series and esters. Duco, like all pyroxylin finishers, and its thinner are highly inflammable. Both Duco and the thinner are free from more than a trace of benzol—0.05 per cent. Duco is used in spray guns and deposits from it or pyroxylin finishers must not be allowed to collect, especially in heated places. No lead pigments are used except in the case of a few shades, but metal primers for use with Duco contain about 30 per cent solids, of which less than one-half is lead or lead salts. Of the surfacers, from 40 to 50 per cent are pigments, of which less than one-half are lead or lead salts. Of the glazing putties from 70 to 80 per cent are pigments, of which about one-half consist of lead or lead salts. In none of these primers, surfacers or putties is there benzol. The various admixtures of the lead salts, used only in a few shades—yellows and greens—are with insoluble materials "so that the probability of contracting lead poisoning even by breathing a lead dust obtained from dry sanding Duco is rather remote." Personal cleanliness is a great factor here. Sanding should be done wet. Putty coats, however, must be dry-sanded, but the surfaces concerned are usually small. Those exposed should wear respirators. The *Bulletin* discusses the preparation of the working surface by sand blasting or a hot caustic solution or phosphoric acid in alcohol. A sand blaster's

helmet supplied with fresh air from a hose connected to the compressed air supply should be used. The vapor hazard is considerable and dependence should not be placed upon ordinary respirators, but upon vapor removal by spray booths and small rooms equipped with proper exhaust. Open windows or skylights do not give sufficient ventilation nor do systems in which fresh air is blown in by fans. The work should not be carried on in an open room since a severe fire hazard as well as health hazard is apt to be created. All containers of Duco should be kept covered or closed. Rags and waste should be placed in covered containers. The interior of spray booths and rooms should be kept scrupulously clean. There is nothing in Duco or materials used with it that should cause a rash or skin irritation. However, some individuals are "poisoned" by contact with common substances that do not affect the average man so that personal cleanliness should be insisted upon. The *Bulletin* gives in detail the rules prepared by the Committee on Manufacturing Risks and Special Hazards of the National Fire Protection Association as applied to pyroxylin finishers. These rules include the use in large plants, mixing rooms, spray booths, spraying, lighting, housekeeping, fire extinguishers, and the rules to be observed in the refinishing shops.—*Bulletin* of E. I. DuPont de Nemours & Co., Inc., Wilmington, Del., 15 pages (Aug.), 1925.

Proposed Standards for Diagnosis of Lead Poisoning—The standards which we propose in the light of our present knowledge for the diagnosis of early or mild and severe chronic lead poisoning among those recently exposed to lead are as follows:

a. Mild Forms—For the accurate diagnosis of early or mild chronic lead poisoning there should be present in every case a definite sign of a lead intake determined by the presence of a blue line or lead in the urine in an amount exceeding .05 milligrams per litre, together with one or other of the following signs of intoxication:

1. The presence of stippled red cells to the number of over 500 per million red cells, with no other blood changes and with or without symptoms of lead poisoning;

2. The presence of stippled cells in number less than 500 per million red cells, with symptoms of lead poisoning;

3. The presence of stippled red cells with other blood changes such as change in size or shape of red cells, polychromasis, reduction of hemoglobin to 80 per cent or less, and reduction of red cells below 4½ million, with or without symptoms of lead poisoning.

The symptoms of mild lead poisoning are taken as abdominal pain, constipation, headache, debility and tremor.

b. Severe Forms—For the accurate diagnosis of severe forms of chronic lead poisoning there should be present evidence of a lead intake, and one or more of the toxic episodes, as colic, palsy, encephalopathy, lead arthralgia. Stippling of the red cells may reasonably be expected in all when examined within a short time of exposure to lead intake and the onset of severe signs or symptoms. In the continued absence of stippled cells from the blood smear such cases can be accepted as lead poisoning only after a careful scrutiny of the other clinical facts, for the absence of this objective sign is rare at the critical period of the poisoning.

It is frequently difficult to separate the mild or early and the severe or late forms of lead poisoning. At any time in the course of a mild attack an onset of colic will result in severe lead poisoning, but for the onset of palsy a more prolonged exposure is required.—Charles Badham, *Studies in Industrial Hygiene, No. VII*; Report of the Director-General of Public Health, New South Wales, for the year 1925, p. 69.

The Scheduling of Industrial Diseases—In accordance with the report of the Departmental Committee on Industrial Diseases no disease was scheduled by the Home Office unless it complied with certain conditions. First of all, it must be a disease and not an accident within the meaning of the Act. Secondly, it must be a disease such as would disable the workman for the minimum period, not less than four days, necessary for compensation. Thirdly, it must be a disease specific to the employment, so that its causation by the employment could be determined in individual cases.

He had been in consultation with the Ministry of Health, and they had agreed to institute a special investigation into cattle ringworm disease with a view to determining how far it could properly be included in the list of industrial diseases.

He hoped the investigation would be completed very shortly, and then the matter would come up for final decision.—Sir W. Joynson-Hicks, Home Office, Great Britain (quoted by *Lancet*, July 23, 1927, p. 207).

The Measurement of the Effects of Noise on Working Efficiency—This very interesting contribution records the results of a series of studies designed to show the effect of noise on the energy consumption of four typists as test subjects. The metabolic rate was obtained from the expired air collected in a Douglas bag. Suitable control periods were used, the subjects then typed a given letter over and over for two hours. Exhaled air was collected and analyzed every fifteen minutes. A noise making instrument was constructed and placed in the room in which the studies were made. This machine, electrically driven, made sounds like an electric motor, the clanking of ball bearings rotated in a hexagonal sheet iron drum, an automobile siren, and a telephone bell intermittently. The room (15'x6'x9') in which the studies were made was constructed of brick and plaster and in its normal condition (when its walls were uncovered) the effect of the noises was actually increased.

This was the condition utilized on half the experimental days. On the other days the walls were covered with panels of acousticelotex (a composition board) which reduced the heard sound by about 50 per cent. It was found in this series of experiments, the duration of which was four weeks (2,000 copies of the letter being produced in this time) that the working metabolism (with noise) was 71 per cent greater than the resting metabolism (taken at the typewriter, no work being done) while the working metabolism with noise diminished was 52 per cent greater than the resting metabolism, that is, the two degrees of noise were marked by a difference of 19 per cent in metabolic rate. Only four subjects were used in these studies but the experiments show that the increase in speed of typing when the noise was reduced was least in the slowest typist and increased in direct proportion to the ability of the typist.

The results are rather inconclusive, judged from the viewpoint of the errors made, for two of the typists made more errors under the more noisy and two made more errors under the less noisy conditions. Under the quieted conditions at the close of the two hour period it took on an average of seven seconds less than at the beginning to type a letter, while under the noisy conditions the time per letter was five seconds more at the end than at the beginning.—Donald A. Laird, *J. Indus. Hyg.*, 9, 10:431 (Oct.), 1927. L. G.

A Clinical Study of the Effects of Mine Gases—Essentially this paper presents the results of the examination and study of the records of 145 men who alleged exposure to and disability from abnormalities of the air of mines in which they worked. The author discusses the chemistry and the physiological action of the various gases found in mines and then proceeds to the consideration of the clinical studies. Of the 30 cases caused by carbon monoxide only 5 men were rendered unconscious, and the period of disability in 18 of the cases averaged six weeks. In 32 cases the complaint seemed attributable to simple stagnant air. The disability in 20 of these cases was known and averaged a little over one week. [The writer of this paper does not describe the particular substance or substances in stagnant air which might produce injury. He points out that it is impossible to say that abnormal gases might not have been present.] Six of the cases in this group were complicated by upper respiratory infections and if these are excluded the disability averaged only a few days. The author feels that stagnant air increases the susceptibility to acute respiratory infections. Carbon dioxide plus nitrogen inhalation accounted for but six cases (4 per cent of the group). Smoke and dust exposure was accountable for but one case. By far the largest single group is composed of 57 cases due to various diseases in no way related to the air of the mines. The great majority of these workers placed the blame on the air simply because they became ill.—Richard F. Herndon, *J. Indust. Hyg.*, 9, 9:402 (Sept.), 1927. L. G.

A Simple Face Mask for Certain Types of Dusty Industrial Processes—This brief paper describes a simple form of mask to be used in dusty atmospheres where the object is not to provide protection from the excessively hazardous dusts of industry, but from those dusts which may cause irritation to the naso-pharynx. The object has been to provide an appliance which would cover the nose and mouth and yet be cool, clean and light. The mask consists of a wire support, shaped so as to fit over the mouth and resting on the bridge of the nose, on which is fastened by means of two clips a piece of butter muslin. This cloth hangs down from the mask and this loose end is tucked into the overall of the worker.—Leonard P. Lockhart, *J. Indust. Hyg.*, 9, 9:421 (Sept.), 1927. L. G.

Night Work in Industry—The Committee on Work-Periods in Continuous Industry of the Federated American Engineering Societies listed about 40 continuous industries as follows:

1. Heat Process Industries—Iron and steel, copper, zinc, lead, nickel, aluminum, flint glass, bottles, window-glass, plate glass, portland cement, lime, brick, pottery.

2. Chemical Industries—Heavy chemicals, fertilizers, explosives, dyes, industrial alcohol, wood distillation, refined corn products, soap, glue, drugs, perfumes, fine chemicals, electrochemical industries, Louisiana cane sugar, refining of imported sugar, beet sugar, table salt, petroleum, cottonseed oil, linseed and other oils.

3. Heavy Equipment Industries—Paper, flour, rubber, breakfast foods, batteries, automobiles, textiles, mines.

4. Service Industries—Electricity power of all kinds, gas, water supply, ice, shipping, transportation, railroads, street railways, telegraph and telephone, mails and express, policemen, firemen, watchmen.

In answer to a question asking whether night workers were more susceptible to disease than day workers 8 plants out of 189 found that night work affected the employe's health. The comment generally received was that night work is not detrimental to the employe's health, provided he secures sufficient rest and sleep. More than 70 per cent of the establishments using the rotating system of shifts, which replied to the Conference Board's questionnaire stated that their experience with night work from the point of view of labor efficiency was just as good or better than with day work. The problem of night work must be solved by management according to the needs of individual industries.—*Natl. Indust. Conference Board Bull.*, 45 pages, 1927.

White Lead Paint Regulations and Ships—"Mr. Rhys Davies asked the Home Secretary whether he had received from the Shipbuilding Federation protests against the regulations governing the use of white lead in paint; what were the objections of the Federation to the regulations; and what steps, if any, he proposed to take to see that the regulations should apply equally to the painting of buildings and ships. Sir William Joynson-Hicks replied: 'The Shipbuilding Employers' Federation have objected to the application of the draft regulations to the painting of buildings in shipbuilding establishments on the ground that the persons employed in such painting are only occasionally so employed. The painting of ships is not in question, as the Act of last session only applies to the painting of buildings.'"—*Med. Off.*, May 14, 1927, p. 230.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Importance of an Adequacy of Vitamin A in the Diet—In a recent paper upon "Requirements of the Population in Milk Fat and the Available Supply," Dr. W. Cramer, Research Assistant, Imperial Cancer Research Fund, discusses the sociological and economic importance of an adequacy of vitamin A in the diet. Recent experiments have shown that rats on a natural diet poor in vitamins grew and bred and were apparently normal but compared with another population in which vitamins had been amply supplied in the diet, it was found that the growth on the poor diet was not comparable nor were they able to rear young as well as on a rich diet. One of the outstanding differences is that the older animals on a poor diet are susceptible to lung infection (septic bronchopneumonia) which rarely occurs on a rich diet. These observations on rats have recently been duplicated by Mellanby in the case of dogs. Vitamin A has a specific stimulating action on the mucous membranes especially those of the respiratory and digestive tracts, which are always in contact with bacteria. When the secretion of mucus is impaired the mechanical and possibly the chemical defense against the bacteria disappears and when the supply of vitamin A is inadequate the activity of these mucous cells is lessened so that bacteria are enabled to invade the mucous membranes producing various infections.

These findings have been confirmed by Koessler, Maurer and McLoughlin who have applied the experimental results in the treatment

of anemia in man. Another incidence of the application of these truths in the human equation is the recent investigation of Dr. Corry Mann on boys in an institutional school, in which it was conclusively shown that the nutritive value of a diet which was originally carefully chosen with regard to the welfare of the children could be strikingly improved by small additions—for example, the addition of 1 pint of milk a day to a diet which in itself satisfied the appetite of growing boys resulted in an average annual gain in weight from 3.85 pounds per boy to 6.98 pounds and an annual average increase in height from 1.84 inches to 2.63 inches. This gain was due not to the fuel value of the diet nor to the extra protein but to the specific qualities of the milk as food. Another result of the additional milk is the fact that during the winter there was a complete absence of illness among boys on the milk ration although in other houses of the village the sickness rate had been relatively higher than usual. While weight and height are the indicators in growing children of adequate nutrition the adult organism is no less dependent on these dietetic factors in so far as liability to infections of the mucous membranes are concerned. It is clear that the living organisms cannot attain full development and maintain it without a supply of vitamin A much richer than that alone necessary to obviate the deficient diseases.

Dr. Cramer discusses the problem of providing an ample vitamin A diet so far as it concerns Great Britain which resolves itself into the production and consumption of a sufficient supply of milk and butter. As a result of a study of dietaries in America, Great Britain and Sweden, it was concluded that 40 to 50 gm. of milk fat per day represent an adequate amount. This seems to be confirmed by a study made by Widmark in Denmark, the involuntary subject of such an experiment during the World War which discloses that when the average consumption of milk fat was kept at a level of 40 to 50 gm. the health of the population improved. It was concluded from figures submitted that the average milk supply in Great Britain is not sufficient to enable the inhabitants to consume the minimum considered adequate. The average daily consumption in England and Wales is estimated at 0.25 pt. per head and at some points even as low as 0.6 or 0.8 pt. per capita. Only one-half of the average milk fat in Great Britain is produced at home, and the other one-half imported from Australia, New Zealand and Denmark. In Denmark the domestic production of milk fat exceeds the needs of the population but the consumption has fallen below the optimum level owing to large exportations.

While it is argued that milk fat like any other commodity is subject to economic law, it is a grave question if the economic consideration in the long run can be divorced from dietetics. Butter may not be replaced by margarine until the minimum requirements for milk fat have been covered. It is estimated that there is probably a world shortage of milk fat and it is also contended that this shortage is not serious because of the other sources in nature of vitamin A. While it is known that the cow does not synthetize vitamin A but produces it from the food and that there is undoubtedly an abundance of vitamin A in nature, nevertheless the fact remains that the main source for human beings of vitamin A is in milk and butter since it is well provided in a palatable form, easy to handle and in milk is combined with a protein of high biological value and essential mineral constituents, which are as a rule more deficient in other varieties of foodstuffs. The situation constitutes a problem, the solution of which is dependent upon the collaboration of the medical profession. While for various reasons a large proportion of the population will not consume an adequate milk supply even if it be available and unless consumption is increased, greater production will not result. The increased demand can be created by the teaching of the medical profession in the matter of dietetics and they can impress upon the farmer the necessity for producing milk clean and rich.—*Lancet*, 2:774 (Oct. 8), 1927.

Vitamin A Deficiency and Metaplasia—This experiment was undertaken to determine whether a single diet deficiency (vitamin A) would induce metaplasia and other changes in glandular organs described by previous investigators. Three groups of black and white rats were used—group I received a diet deficient in vitamins A and D; group II a diet deficient in vitamin A alone; and group III a diet complete in every respect including cod liver oil. The rats in groups I and II ate 10 to 20 gm. daily and 7 to 15 gm. later, while those on group III ate from 15 to 25 gm. daily throughout the experiment. The animals were sacrificed at varying periods and tables are given showing the autopsy findings. Of 19 rats (group

III) on a complete diet, none showed keratinizing epithelium; of 26 rats (group I) 23 showed metaplastic changes in varying degrees in one or more organs; of 18 rats (group II) 17 showed metaplastic changes in the epithelium similar to that in group I. The changes were found to be as extensive in those rats on a diet deficient in vitamin A alone as in those which received a diet deficient in both vitamins A and D. It was concluded that a dietary deficiency of vitamin A alone is sufficient to induce metaplasia of columnar, cuboidal, and transitional epithelia in some organs. The squamous keratinizing type of epithelium metaplasia in young rats on a vitamin A deficient diet for 10 weeks or longer may be used as a morphological indicator of this deficiency. An inadequate food supply alone does not induce the metaplasia.—Harry Goldblatt and Maria Benischek, *J. Exper. Med.*, 46:699 (Nov. 1), 1927.

Jatrophine: A New Alkaloid—A new alkaloid designated Jatrophine has been extracted from the plant classified as *Jatropha gossipifolia*. This plant is known by the natives of Colombia as "Tua-tua" and "Purga del Fraile." It is used to cure disorders of the stomach and to avoid nephritic and hepatic colics. An analysis is given of the bark which contains 11.72 per cent substances soluble in 95 per cent alcohol. Besides the alkaloid contained chiefly in the bark, the plant contains a considerable amount of vegetable cholesterol which is not identical with phytosterol and has been termed isophytosterol with a characteristic specific rotation. A method is given for the extraction of isophytosterol and separation of the alkaloid. Reactions of jatrophine are given as well as the empirical formula $C_{14}H_{20}O_6N$. A test of its toxicity indicates that the toxic dose is about 0.2 gm. per kg. body weight as the result of subcutaneous injections in guinea pigs.—Prof. A. M. Barriga Villalba, The University, Bogota, Colombia, S. A., *J. Soc. of Chem. Ind.*, 46:396 (Oct. 7), 1927.

Manganese Content of Plant and Animal Materials—The manganese content of 84 samples of foods, such as fruits, vegetables, cereals, nuts and meats, bought in the local market, is given. Determinations were made according to the method of Willard and Greathouse described in the Methods of Analysis of the Association of Official Agricultural Chemists. It was found that the manganese varies widely—from none in some species of fish to 0.02162 in northern grown lettuce. Tree fruits in temperate regions are low in manganese while some tropical tree fruits are high (banana). Leafy vegetables were found to be highest in manganese followed by cereals, legumes, nuts, roots and tubers, bush and vine fruits, animal tissues and tree fruits.—C. W. Lindow and W. H. Peterson, *J. Biol. Chem.*, 72:169 (Oct.), 1927.

Phytochemical Production of Vitamin D from Ergosterol—The authors have continued their previous work on the activity of ergosterol to determine the limits of the curative doses of this substance. In an effort to establish first the conditions for the maximum production of vitamin D under ultra-violet radiations, it was found that when 0.1 per cent solutions of ergosterol in pure ether or alcohol was exposed for a period of 30 to 40 minutes, the maximum amount of antirachitic activity is produced by irradiation for half an hour, but that prolonged irradiation—four hours—produced the same results as for 30 minutes, and the antirachitic activity of the reaction does not proceed parallel with the disappearance of ergosterol but remains constant. Exposure of ergosterol to sunlight justifies the conclusion that the long wave-length ultra-violet radiations of sunlight and those which penetrate vita glass are able to impart to this substance antirachitic properties. Since the human skin contains a considerable amount of cholesterol which in turn undoubtedly contains ergosterol, the explanation of the curative effects of the sun's rays in the case of rickets is undoubtedly due to the activation of ergosterol by the ultra-violet sunlight radiation. The authors have shown that the lowest protective dose of vitamin D induced by irradiation of ergosterol was 1/10,000 to 1/20,000 mg. per day for the rat.—O. Rosenheim and T. A. Webster, *Lancet*, 2:622 (Sept. 17), 1927.

Vitamin A in Evaporated Milks Made by Vacuum and Aeration Methods—In view of the fact that other workers have not shown the history of the raw milk in their study on vitamin content of evaporated milk, work was undertaken in which evaporated milks were compared with equal volumes of certified milk from which they were made. Two types of evaporated milks were studied—(1) that made by the vacuum process, and (2) that made by the aeration process, the former representing commercial evaporated milk. The aerated type

was studied because of the probability of vitamin destruction by oxidation. One experiment was conducted using the so-called prophylactic method of feeding and this was repeated using the curative method of feeding and irradiating the basal ration. Apparently the vacuum and aeration methods of evaporating milk are responsible for an appreciable destructive action of vitamin A which is not due to heat. It is concluded that the destruction may vary from 10 to 30 per cent depending on the treatment of the milk. It is, therefore, contended that evaporated milk by the vacuum process has lost some of its nutritive value and that this loss is probably due to the destruction of vitamin A.—R. Adams Dutcher and Hannah E. Honeywell, *J. Biol. Chem.*, 75:85 (Oct.), 1927.

Relation of the Inorganic Constituents of a Ration to the Production of Ophthalmia in Rats—In view of the findings of previous investigators that ophthalmia was produced in rats on a diet supposed to be satisfactory in vitamin A, investigation was undertaken to determine whether oxidation changes are responsible for the reduction in potency of the vitamin A in butterfat. It was found that a ration containing 5 per cent butterfat which McCollum, Simmonds and Becker found produced xerophthalmia in rats, would not lead to the production of ophthalmia when the butterfat was incorporated at intervals of about 5 days; the animals grew normally and did not develop sore eyes. When the butterfat was added to the same ration in quantities sufficient to last 6 to 7 weeks, xerophthalmia developed in about 10 weeks with attendant loss in weight and subsequent death of the animal. When butterfat is incorporated in less quantities the development of xerophthalmia is dependent upon the amount of ferrous sulfate in the ration, suggesting that the failure of the animals under these conditions is due to the oxidative destruction of vitamin A, the oxidation being increased by the catalytic action of the ferrous sulfate.—James H. Jones, *J. Biol. Chem.*, 75:139 (Oct.), 1927.

Separation of a Substance from Oils Which Inhibits Destruction of Vitamin A by Ferrous Sulfate—In a previous paper it was reported that ophthalmia induced in rats by the addition of ferrous sulfate in the food mixture can be prevented by the addition of wheat germ oil. In conducting the investigation the authors separated a substance from the cod liver oil in the form of its lithium chloride derivative, which is effective in restraining the destruction of vitamin A by ferrous sulfate. The method of separating this substance is given. From preliminary observations it is probable that the substance extracted from certain oils by lithium chloride dissolved in pyridine may be vitamin E.—Howard W. Estill and E. V. McCollum, *J. Biol. Chem.*, 75:157 (Oct.), 1927.

Quantitative Study of the Problem of the Multiple Nature of Vitamin B—Reference is made to the investigators who have offered experimental evidence to support the dual nature of vitamin B. A new terminology is suggested in that the antineuritic factor be designated vitamin F and the other (Goldberger's P-P) be known as vitamin G. Rats were placed on a basal diet deficient in vitamin B but adequate and optimal for growth in other respects. The foods tested in this experiment were ground whole wheat, autoclaved yeast, and dried skimmed milk. After a satisfactory feeding level had been established, vitamin B was supplied with 0.8 gm. per day of ground whole wheat; or 0.8 gm. of autoclaved yeast; or 0.4 gm. of wheat and autoclaved yeast, with negative control experiments of the three basal diets. Graphs are given showing that the relationship was supplementary and the effect not additive when yeast and wheat were fed together, compared with feeding each separately for vitamin B. Two-tenths gm. of dried yeast supplied both factors for the growth of rats, whereas four times that much of autoclaved yeast indicated the presence of but little vitamin F. Apparently the yeast in an autoclave at 15 pounds pressure for 150 minutes destroyed much if not quite all of the vitamin F (antineuritic). The feeding of autoclaved yeast to rats on a diet satisfactory except for vitamin B resulted in weight gains for short periods only. The supplementary relation shows that whole wheat is relatively rich in vitamin F and it is limited in the vitamin B value by the relatively low content of vitamin G. On adding a mixture of 0.4 gm. ground whole wheat and 0.3 gm. dried skimmed milk compared with double the quantity of each alone, it was found that milk and wheat were supplementary, but similar experiments showed no supplementary relation between milk and autoclaved yeast, indicating milk relatively richer in vitamin G than in vitamin F. These feeding experiments demonstrate the significance of the differences in growth supporting the view that the vitamin B

complex contains more than one substance essential to growth.—H. C. Sherman and J. H. Axtmayer, *J. Biol. Chem.*, 75:207 (Oct.), 1927.

Cooking and Food Value of Eggs—Scheunert and Wagner fed young rats with raw, soft boiled and hard boiled eggs. The rats did not thrive on raw eggs, but developed well when the eggs were boiled. The authors deny the existence of a "budget value" of food, in Friedberger's sense.—*Deutsche med. Wochenschrift*, Berlin, 53:1247 (July), 1927. Abstr., *J. A. M. A.*, 89: 1288 (Oct. 8), 1927.

Outbreak of Milk-Borne Sonne Dysentery—An outbreak of bacillary dysentery of considerable dimensions, which has been proved to be due to milk infected with *B. dysenteriae* Sonne occurred in St. Andrews in September, 1926. This is the first time an outbreak of milk-borne dysentery due to the Sonne strain has been recorded. In this outbreak there were over 150 cases in 80 households and no fatalities, the absence of mortality being in marked contrast to the high mortality rate which is associated with milk-borne outbreaks of Flexner dysentery.

Several milk-borne outbreaks of enteritis simulating dysentery infections have been recorded in which the evidence has pointed to an unidentified organism as the causal agent. The author concludes that in the future *B. dysenteriae* Sonne will require to be excluded from the group of the unrecognized viruses.—G. Matthew Fyfe, *British J. Hyg.*, 26:271 (Aug.), 1927.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

IT IS becoming more and more recognized that in many parts of the United States the midwife problem is a major one. The great difficulty has been to find even partially qualified midwives and much of the energy of state boards of health in large centers of our country is directed toward instructing and improving the status of the midwife.

It is interesting to find that in the Kingdom of the Netherlands conditions are very different from those in America so far as the midwife is concerned. For the sake of contrast and because we are apt not to appreciate the fact that other countries may have solved problems similar to ours in a more satisfactory manner than we have been able to attain, there is inserted a summary of an article by S. Sievertsen Buvig, who is Mistress-Midwife of the State Training School for Midwives in Holland. This article is the twelfth in a series on Midwifery which has been running in the *Public Health Nurse*. The article appearing in the October, 1927, issue is summarized here:

MIDWIVES IN HOLLAND

Madam Buvig points out that in her country the importance of well instructed midwives was very early recognized. They were under the superintendence of the local Surgeons' Guild, receiving a certificate from the Guild. These midwives were entitled to take pupils who in turn received certificates from the Guild. Midwife supervision was always under the control of highly trained people. In 1861 a State Training School for Midwives was founded at Amsterdam. The training school as originally founded gave a course of instruction for two years. For the last 5 years, however, the course has been 3 years.

To be eligible for entrance to the training school a prospective midwife must have had the usual Board School education and must have an entrance examination. Candidates are admitted in order of merit. The instruction during the first year is almost entirely theoretical and includes such subjects as anatomy, physiology, obstetrics, bacteriology, physics and chemistry. Practical work is also given during this year, but is confined to domestic assistance in the lying-in wards. In the second year the pupil under the guidance of the mistress-midwives, conducts labors, nurses patients, and attends infants. She also gets further theoretical instruction in obstetrics.

Passing the examination at the end of the second year, she enters on her third year work

which is outside the school, in the actual homes of her future patients. During this year she receives instruction in hygiene and child welfare and assists at the consultation bureau for child welfare. Another examination at the end of the third year successfully passed makes her a professional midwife.

An interesting phase of obstetrics in Holland is that far fewer patients are now handled by the midwife than formerly. Some years ago doctors were scarcer and charged more in proportion than did the midwife. Consequently, the latter attended the poorer people and the doctor attended the well-to-do. However, Madam Buvig points out that now her country has a superfluity of university graduates and of doctors to such a degree that they feel justified in making use of the term "intellectual masses" in the same way as reference used to be made to the "uneducated masses." Holland now has enough doctors to begin to compete with the midwife so that in recent years fewer labors have been attended by midwives. During the past year midwives attended approximately 60 per cent of the labors.

The status of the midwife in Holland is far better apparently than that of her sister worker in this country. Part of the reason for this is undoubtedly her far greater training. They are banded together into a union which has a scientific journal of its own called *The Journal of Midwifery*. Some of the midwives are in the employ of the municipality, receive a fixed salary and are under the direction of the Medical Officer of Health. The majority, however, are in practice for themselves.

Better **Teeth**—Under this title comes a pamphlet by Dr. James F. Rogers, Chief, Division of Physical Education and School Hygiene, United States Bureau of Education, which discusses in considerable detail the problem of dental hygiene as it affects the school child. It tells of the making of good teeth, of the eruption of them, of their decay, and the effects of diseased teeth, and then takes up the subject of dental prophylaxis and hygiene in the schools. It is illustrated with seven figures. The summary which appears at the end of the leaflet contains much in small space and is worth being quoted verbatim:

SUMMARY OF SCHOOL DENTAL WORK

Examination and treatment—1. The child should be examined in the first, third and sixth grades by the school dentist, and defects of development in the second teeth should be appropriately treated at the time of examination.

2. Children should be examined annually by the teacher, nurse, dental hygienist, dentist, or medical inspector in charge of the physical examinations, and all cavities and other diseases should be treated by the family or school dentist so far as possible.

3. Treatment should be secured for all cases of deformity of the jaws or malocclusion.

4. The instrumental cleaning of the teeth should be done by a dental hygienist if one is employed.

Teaching of dental hygiene—The teacher should present at appropriate ages the following information in regard to the teeth, the details being found in any recent textbook of hygiene:

1. Straight, sound teeth are of the greatest importance (a) for use, (b) for looks, (c) for health

2. The making of teeth begins long before birth.

3. Good teeth can be made and preserved only from right materials derived from right food and feeding and the practice of other health habits essential for good nutrition.

4. Wild animals have perfect teeth and many tribes of men have few imperfect ones.

5. Our defective teeth come from racial and parental ignorance on this subject, and we should make the best of what we have and try to improve the teeth of our children.

6. Teeth are more or less living structures, and not only depend for their health on the body in general, but the health of the body is affected by disease of the teeth.

7. The permanent teeth of 90 per cent of children have, on their first appearance, imperfections of enamel, in which decay will probably begin unless they are treated.

8. The earlier that decaying teeth are treated, the surer will be their preservation.

9. There are no nerve structures in the enamel of the teeth; there is, therefore, no pain or other sensation at the beginnings of decay, and these beginnings can only be detected by examination. There is least discomfort from treatment and less likelihood of subsequent disease if it is done at this time. It is, therefore, best from every point of view to visit the dentist for examination at least twice a year.

10. Crooked or misplaced teeth look badly, they may affect the health, and much can be done toward their improvement.

11. Nothing adds more to the appearance of well-placed teeth than cleanliness, and this is

accomplished by the use, morning and night, of a good brush, supplemented by instrumental cleaning by a dentist or dental hygienist if necessary.

12. We all desire better teeth for our children, and these depend to a large extent on the health habits of the mother, and the quality of food materials she furnishes to the child from its conception. Feeding, sunning, airing, sleeping, exercising, and clothing of the child after birth are just as important if he is to have the best teeth which it is possible for him to possess, for these conditions all affect his nutrition more or less.

Some Recent Observations on Fat-Soluble Vitamins—"The current widespread interest in the therapeutic and prophylactic use of the fat-soluble vitamins, notably as they are available in cod liver oil and concentrates prepared from it, makes timely every reference to their possible limitations or alterations in efficacy. We have already referred to the suggestions of Hart, Steenbock and others that the concentrate of vitamins A and D represented by the non-saponifiable fraction of cod liver oil is not effective in herbivora unless it is fed dissolved in oil. More recent studies of Daniels and Brooks at the Child Welfare Research Station of the University of Iowa confirm these observations in the case of an omnivorous species. The outcome makes one question the advisability of attempting to supply the vitamins to man in the form of dry concentrates unless the latter are given in oil or in close proximity to a meal that carries fats.

The ready solubility of vitamins A and D in fats of various sorts has made it seem likely that liquid petrolatum would also be a good solvent. The latter, however, is not absorbed from the gastro-intestinal tract. As liquid petrolatum has a wide-spread use as a laxative in persons of all ages, it is important to ascertain whether the fat-soluble vitamins in the food are liable to be "diverted" from alimentary absorption by the presence of the non-absorbable liquid petrolatum solvent. The recent investigations of Dutcher and his collaborators at the Pennsylvania State College leave no doubt that liquid petrolatum may act as a solvent for vitamin A, thereby depleting ingested foods of their supply of this factor. A comparable influence on the antirachitic vitamin has not yet been demonstrated, though it may naturally be expected if liberal amounts of liquid petrolatum are ingested. There are possibilities of deprivation not to be overlooked in the case of habitual users of liquid petrolatum in abundance.

The demonstrated ease of developing antirachitic potency in many foods by subjecting them to ultra violet irradiation or even to direct sunlight has raised the question of increasing the Vitamin D content of cod liver oil in a similar manner. The actual experiment has been tried by several investigators, most recently by Daniels and Brooks. The evidence indicates that irradiation of cod liver oil does not increase its antirachitic potency."—Editorial, *J. A. M. A.*, Aug. 27, 1927.

The Pros and Cons of the Nursery School—The nursery school, which is still in the experimental stage here in America, often is a topic for discussion among mothers and all individuals interested in child development and training. Mrs. Frankel presents her "pros and cons" from the standpoint of a mother.

In a nursery school, the preschool child is taught group participation in eating, playing, and sleeping. Good manners are stressed; there is less opportunity for a child to become the center of the stage as is often the case in the home drama; the child is taught initiative and self reliance.

A nursery school surpasses the care given by a nurse or governess. Also its opportunities for play are better than that of a crowded apartment district. However, any mother, Mrs. Frankel states, who has the time, the training, and the desire to create the proper environment for her child can do so as well as the nursery school. Only those youngsters who are shy and retiring really need the early companionship of other children, such as a nursery school provides. Oftentimes this companionship may be provided by other children in the family or in the neighborhood. In the end, says the author, it all depends on the mother.

This is still a much discussed question with experimental work being carried on for the purpose of answering many of our bewildering queries.—Ruth L. Frankel, *Hygeia*, Oct., 1927.

Germany's Maternity Insurance Law—The *Weekly Notes* of the Children's Bureau carries an item with regard to legislation in Germany under the Maternity Insurance Law. It points out that the old law prohibited the employment of women for two weeks before and six weeks after confinement but applied only to women employed in industrial establishments with ten

or more workers. Under the new provisions the employment of women is prohibited for 6 weeks before and 6 weeks after confinement and includes all wage-earning women except those in agriculture, forestry, animal husbandry and fisheries.

A further provision is that a woman may be given an extension of another 6 weeks if the state of her health prevents her from returning to work and also that nursing mothers at their request must be given nursing periods amounting to one hour a day for 6 months after confinement. No woman can be discharged by her employer during the 6 weeks preceding and 6 weeks following confinement.

Therapeutics of the Cardiac Child—As cardiac disease is such a common cause of death we cannot hear too much of its prevention and cure.

Heart disease in early childhood is usually congenital, and the congenital cardiac patient is apt to be neglected. Much can and should be done to ameliorate the condition, the main points being to prevent infection, increase oxygenation of the blood and aid the circulation by means of fresh air, rest and appropriate diet and medication.

Acquired heart disease during first, second or third years of life, is mainly due to septic infection. After 3 years rheumatism is the most common cause.

Labeling heart disease as "mitral," "aortic" or "pulmonic" is a common error. "The disease is an endocarditis, or a myocarditis, or a pericarditis, or a carditis with a mitral or aortic or pulmonic lesion, depending on the valves mainly affected."

Cardiac clinics should include the "precardiac" child. Here is a great field for preventive work. "The treatment of heart disease must be started at its source. Insufficient wholesome food, scanty clothing, unhygienic care, cold and damp dwellings, exposure to bad weather and poverty in all its ramifications lay the foundation for heart disease. The remedy is a financial one, and when properly and adequately applied is specific. Rheumatism in all its forms and manifestations must be thoroughly treated and all local infections eradicated. Every child with a rheumatic diathesis should be under observation. It is in the precardiac stage, that is, when the child has suffered some heart damaging illness without actual destructive cardiac changes, that much good can be done."—Dr. J. Epstein, *Arch. Pediat.*, Sept., 1927.

Common Fallacies in the Feeding of School Age Children—Lack of individualism in the application of dietetic standards, Dr. Grulee points out as the greatest fallacy. Milk must be used wisely—the proverbial quart a day should not receive wholesale prescription. He reminds us that milk is a very concentrated food and that forced feeding not only ruins the appetite for many of the essential foods but is, also, conducive to constipation. Eggs likewise should be given with discretion—two a week for the younger child (18 months to 2 years) and never more than one a day, preferably at noon, for the school child. Bacon is another food fallacy and custom seems to be the only excuse for its presence in the diet. Bacon, after all is pork, it contributes no element of special value, it is very concentrated and contains no vitamins. Sweets should not be eaten between meals nor in large quantities.

These problems of food must be solved with the idea of less standardization and more individualization. Be certain that the child has no physical defects which will disturb his nutrition. Cater a bit to his likes and dislikes but do not be governed by them. Give inheritance its due and remember that some children are thin and others fat not because of diet but because of natural tendencies. Dr. Grulee believes "that the best results in the nutrition of children are to be obtained not by dogma but by enlightened judgment."—Clifford G. Grulee, M.D., *Nation's Health*, Sept. 15, 1927.

PUBLIC HEALTH NURSING

MIRIAM AMES, R.N.

Nursing in Tuberculosis—In the July, 1927, issue of the *American Journal of Nursing*, there is an excellent article on "Nursing in Tuberculosis," by Katherine Good Amberson, R.N., Superintendent of the D. Ogden Mills Training School for Nurses. The following sums up this worthwhile paper:

The question as to how the routine care of the tuberculosis patient differs from that given other patients has been asked many times. The answer demands the consideration of the treatment prescribed by the physician—rest, fresh air, and good food in proper balance.

Rest for the seriously ill tuberculosis patient means that precautions will be taken, so that all unnecessary movements on his part must be avoided. Only two baths are given each week. All the details of his toilet are the care of the nurse. As improvement takes place, and he is allowed to do some few things for himself, she should note his reaction to any increased activity.

The patient needs fresh moving air but must not be exposed to draughts. A temperature of about 68 degrees is satisfactory. It is best to depend upon a room thermometer for the regulation of temperature. In warm weather, the patient should be warmly but lightly covered.

The tuberculosis patient often has a fastidious appetite. This should be catered to, but the patient must not be so over-fed that gastrointestinal disturbances result. Sometimes small amounts frequently served are best tolerated. If an article with little caloric value is the one which appeals to the patient, some nourishing food must be added delicately as lactose, eggs, butter or cream. Seared, scraped beef, raw, often may be given in dainty sandwiches. It is exceedingly important that the food be attractively served upon an immaculate tray.

Certain forms of tuberculosis demand special care. The occurrence of hemorrhages in pulmonary tuberculosis (one dram or more of blood from the lungs constitutes a hemorrhage) will probably cause the patient to be very apprehensive. He should first be reassured. An ice cap is placed over the heart. Crushed ice is given in small amounts. The diet is always ordered by the physician. Usually liquid diet is given for the first 24 hours. Hot foods or drinks, vinegar or lemon juice, irritating foods, coffee or tea are not given. The patient should be kept quiet, all movements which might stretch the lung being avoided.

In communicating his wants, the patient with tuberculous larynx should make use of a pad and pencil. Loud talking and laughing must be avoided. Cold compresses on the throat bring relief. Irritating, highly seasoned, or hot foods, should be omitted from the diet. Foods that "slide" down are most easily taken.

In cases of intestinal tuberculosis no nursing care is required unless ultra-violet ray or sunlight treatment is given. When acute intestinal symptoms are present, the diet should be smooth. Much sugar, salads, most green vegetables, and raw fruits, should be avoided.

One of the most important duties of the public health nurse in tuberculosis work is the education of the patient. Each victim of the disease must know how the disease is spread and what precautions must be taken so that he will not be a source of danger to others. Perhaps a harder lesson, but one that is fully essential, is the one of self-restraint in work and play—to stop before there is a feeling of fatigue.

Poliomyelitis Again—The program read: "Our Poliomyelitis Problem," by Dr. Milton J. Rosenau, Professor of Preventive Medicine and Hygiene, Harvard University; "The Epidemiology of Poliomyelitis," by Dr. W. Lloyd Aycock, member of the Harvard Infantile Commission, Director of the Research Laboratory, Vermont State Health Department.

Although these papers were given at the October meeting of the Massachusetts Association of Boards of Health and were primarily for them, they also attracted a number of nurses interested in poliomyelitis. It seems only fair to pass along the points made to the many nurses unable to be present who are likewise interested.

Dr. Aycock spoke of the early diagnosis of the disease, serum treatment, and prevention. The symptoms vary, all cases not having all

symptoms. Fever may be present (about 101 or 102), headache and vomiting, twitching of the muscles, pain in arms or legs, and backache. A rapid pulse may occur, more rapid than would be associated ordinarily with the comparatively low fever. The child looks alert and apprehensive. Reflexes may be disturbed. Perhaps the sign which might be considered the most diagnostic is the rigidity of the spine and neck. The child tries not to bend the spine. This sign is commonly present from the beginning of the disease. The increased cell count in the spinal fluid may also help to confirm the diagnosis.

Treatment—During the Haverhill, Mass., epidemic the use of convalescent blood serum as a treatment has been studied. While it is impossible to know just how severe the complications (paralysis) would have been without the use of the serum, in 100 cases treated in the first 36 hours in the preparalytic stage but one death occurred instead of the usual 20 per cent when serum is not used. Furthermore, paralysis did not develop although in quite a few cases muscles were weakened.

Prevention—To know how to prevent a disease it is necessary to know how it is spread. The question of prevention of poliomyelitis is still undecided. Observation shows that three epidemics were definitely milk-borne. Indirect observation shows that poliomyelitis affects the same age group as diphtheria and scarlet fever. Urban and rural communities are affected in much the same manner as they are affected by measles. This seems to indicate that it is a question of immunity whether or not older people get the disease (even as in diphtheria). Diphtheria is recognized as diphtheria in 1 out of 10 persons; that is, whereas 10 persons may come in contact with the disease and become immune, only 1 is immunized by actually having experienced the disease. As far as poliomyelitis is concerned, symptoms appear in about 1 out of 1,000 persons.

Experimental procedure indicates that the secretion of the upper respiratory tract is able to spread the disease. Experiments also seem to reinforce the theory of immunity as the blood sera of many normal persons never having had recognized poliomyelitis neutralize the virus of the disease whereas that of monkeys will not.

The keynote of Dr. Rosenau's address might perhaps be stated as, "We do not know" about poliomyelitis. Whereas the incubation period was formerly considered to be short, it is now regarded as being from 7 to 14 days, usually 10 days. There is a periodicity of cases in Massachusetts as an excess of cases occurs about every 3 years. One attack gives immunity to persons and places. No person has been known to have had the disease twice. A community in which an outbreak takes place does not have a second for a few years. Dr. Rosenau believes that there are no unfailing symptoms whereby the disease may be diagnosed. As far as transmission is concerned, it is his opinion that the disease may resemble typhoid in that it may be spread in more than one way. He concluded his remarks by again emphasizing the fact that little is definitely known about this baffling, mysterious disease.

Henry Street Demonstrates—Thirty-five years ago, the Henry Street Settlement inaugurated the first Visiting Nurse Service. Since 1892 this Settlement has offered nursing service for those who could or could not pay for it. Now, this same Visiting Nurse Service is conducting a drive, but this drive is very different from the ones usually conducted by organizations. It is not out for funds, but to let people know what part the Henry Street Settlement has played and is willing to play in improving the health and home conditions of the community.

That the community is large is shown by the fact that in the 35 years of service one center has grown into eighteen.

The First Annual Report—Our attention has been arrested by the appearance of the *First Annual Report of the Visiting Nurse Association of San Francisco, Calif.*

The cover is inviting, and we turn the first page to become acquainted with the nursing staff at headquarters. A brief history of the public health movement leading up to the organization is given by the president of the association.

Thirty years ago, Miss Octavine Briggs, the first visiting nurse, established herself in a neighborhood in San Francisco with the idea of giving nursing care to her sick neighbors. Five years later, a visiting nurse center was established in San Francisco through the efforts of a graduate nurse, Miss Elizabeth Ashe, New York City, who had watched the development of the visiting nurse service at Henry Street from the time when the first school nurse left the house on Henry Street for the first time. Miss Ashe had vision which made her realize the significance of this public health step, and soon the movement developed

into a city-wide program of public health under the direction of the San Francisco Department of Health. Little bedside nursing was done, although there was a pressing need for it, as was revealed in 1921 when an intensive study was made. At that time, the Metropolitan Life Insurance Company and the visiting nurse center were the only two agencies doing bedside nursing.

In October, 1925, following a survey of the nursing activities in the city made by Dr. Haven Emerson, the Visiting Nurse Association was organized and ready to function with the help of the existing agencies, who pledged their support and turned over their nurses to the Visiting Nurse Association. Fourteen nurses began their definite contribution to the health of the city of San Francisco. During the year, 32,593 visits were made; 5,608 of these visits were made to patients with communicable diseases. Seventeen thousand, three hundred, ninety-nine general nursing visits were made to persons of all ages, both medical and surgical cases. The maternity service provides for prenatal supervision, care at time of confinement, and postnatal care.

The director is anxious to maintain a high standard of work, and the staff members must qualify by meeting certain educational and professional requirements. The new nurse receives instruction, including demonstrations, conferences and supervised field visits, when she is introduced into the district. Weekly staff meetings are held for all nurses.

A definite need for mental hygiene work and nutrition specialists has already been demonstrated. Local centers are needed in various districts, and better coöperation with existing clinics and health centers is looked for as time goes on.

The year's work has demonstrated that San Francisco is helping to solve the nursing problem of the "high cost of illness."

Highlights for Nurses from Fifty-Sixth Annual Meeting, A.P.H.A.—Owing to the fact that it was a physical impossibility for one person to be in three places at once, many of the outstanding features of the sessions of the Fifty-sixth Annual Meeting of the American Public Health Association held at Cincinnati, O., Oct. 17–21, must go unrecorded in the Public Health Nursing Section. Certainly the members of this section feel that successful efforts were made on the part of the local committee to make satisfactory arrangements for the places in which the meetings were to be held, and to make the excursions, both instructive and pleasurable. The Sectional Committees too, deserve much credit for the interesting selection of papers and the careful plan to insure as little overlapping as possible.

It was noticeable, however, that the nurses more than filled the quarters assigned to them. This was very gratifying in one respect, but not altogether comfortable. The attendance at the Public Health Nurses' Sessions is increasingly large from year to year, according to all accounts, showing that the nurses are doing more thinking about public health in a bigger, more general way.

Some of the notable features of the sessions were as follows:

1. *Child Hygiene Section*—"The Present Status of Maternal and Child Hygiene in the United States," and the ensuing papers dealing with the Pre-School and the School Child brought this movement up to date.

   The important points made in the first paper were that adequate maternity care is necessary for the rural mother if the general maternal mortality rate is to be reduced; also, that more concerted effort must be made to reduce the number of stillbirths and the deaths among infants during the first month of life.

2. *Public Health Nursing Section*—(a) Dr. Winslow gave a comprehensive report of the grading school study. His summary indicated that there is no shortage of nurses, but they are poorly distributed. In order to make the supply meet the demand, the problem of organization must be solved.

   (b) At the *Joint Session of the Health Officers and Public Health Nursing Sections* much importance was attached to the necessity of advisory committees, made up of representative persons to direct the policies in Public Health Nursing. This was emphasized in relation to the changing focus of attention from voluntary to municipal agencies.

3. *Public Health Education Section*—Great interest was manifested because of the demonstration method which was used, not only for showing what can be done, but for showing how it can be done. Special instances of this were the Health Plays, and "A Demonstration of Talks on Diphtheria Immunization." The attendance at these meetings was large, and it was quite evident that members of other sections were present.

4. *Health Officers' Section*—These meetings

were thronged, not only with doctors and health officers, but also a generous sprinkling of nurses, and an obvious conclusion was that the problems of these two groups were much the same.

5. Exhibits—A new feature was the exhibit of Administrative Methods arranged by the Committee on Administrative Practice. Each exhibit represented some function of public health work well done in a particular city.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN *

Whose Job Is It? — Dr. Earp's[1] comments on the teaching of publicity methods in schools of public health, which appeared in the October JOURNAL, strengthen my suspicion that the art of shaping public opinion is not appraised at its real value by public health leaders. Is it because certain types of press-agentry and commercial advertising have become tarred with the stick of bunk, sham and bombast that is so odious to the quiet dignity of the medical man, or is it that public health leaders fail to recognize that publicity involves a technic just as highly-developed and important as the technic necessary for making practical application of medical facts?

Dr. Earp cites an adroit trick played on his class by Dr. Freeman. A poster was exhibited in one meeting and about a week later the students were asked to describe it. "You would be surprised how few of us had any idea what it was about!" A capital joke! The identity of the poster is not betrayed but presumably it was a health poster. If it was a "typical" health poster I want to join in the guffaw for I have seen enough of such, and wept—I have, alas, made some of them myself.

But did that experiment prove that the class was too highbrow to be influenced by it, that posters are not intended to be "remembered," or simply that that particular poster for some reason failed to register? In sober earnestness, what we want to know—we, who in our groping, untutored way are trying to interpret health facts to the public—is, *why* that poster made no impression. And that goes for all other forms of publicity as well: printed matter, motion pictures, newspaper publicity, the spoken word. We should like to know at least what the functions and limitations of these several publicity instruments are. Vaguely we feel that we, that is, health workers of the garden variety, are being deprived of certain tools and equipment in the form of technical knowledge which other groups whose success is dependent on creating public support, use to enormous advantage—merchants, for example. The art of publicity is not magic but a more or less precise application of technical skill involving knowledge of typography, literary style, graphic art, composition, time, place and manner of display, choice of publicity medium, human frailties and "sensitive spots" and dozens of other details of *method* which the health specialist, engrossed in the *matter* of his subject, brushes aside as of no consequence.

Public health progress is definitely limited by public opinion. No matter how complete our epidemiological and sanitation knowledge may be we cannot, in a democracy, save the people unless they will it. Getting them to will it implies an ability on our part to inform, persuade and inspire. Even now it is apparent that the gap between the leaders and the public is so great as to nullify much of the benefit that the people might enjoy if they could but be kept from straggling so far behind the vanguard. Dublin estimated that if extant medical knowledge were to be applied fully, at least 15 years could be added to the present average life expectancy. We are hoarding untold riches—not because we are miserly but because we do not know how to distribute them.

Health publicity, not to mention health education which is even more complex, requires a technic as surely as does epidemiology. It is

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York City.

1. Dr. Earp Says That They Do Study Publicity and Education Methods. *A.J.P.H.*, 17, 10:1102 (Nov.), 1927. See also Public Health Workers Do Not Study Publicity and Education Methods. *A.J.P.H.*, 17, 8:879 (Aug.), 1927.

not enough for the student of public health to know that a typhoid carrier can infect a city, he must learn, too, the practical methods of searching out the carrier and of stopping the epidemic. Neither is it enough to teach him that for the solution of this or that problem he must get public opinion back of him, unless he is given also some idea as to how to turn that little trick. Of course, the health administrator cannot be expected to become a publicity expert any more than he is a specialist in the numerous other departments of work he is supposed to supervise. But to relegate health publicity into the general grab-bag of unrelated things means that publicity is nobody's job in particular, and though Oscar, the faithful office boy, does his best, the publicity material that emanates from many a health department is a poor reflection of the otherwise fine and thorough work done.

I am not a graduate of a public health school and hence cannot presume to say whether publicity is adequately taught there, or whether it would be advisable to endow a chair of publicity in the public health school. But I for one do feel keenly the need of training in the technic of publicity and I do come in contact with many workers who also have that need—whether they feel it or not. Whose job is it to supply that need?—H. E. Kleinschmidt, M.D.

A Calendar of Quotations—Such is the 1928 holiday issue of the National League of Nursing Education, 370 Seventh Ave., New York, N. Y. "Between its covers is found the wisdom of poets and philosophers from ancient down to the present time." $1.00, or $.75, for 50 or more.

We Missed You—And You Missed a Lot—That is, if you failed to get to Cincinnati for the Fifty-sixth Annual Meeting of the A.P.H.A. Several of the Public Health Education Section addresses will appear in the JOURNAL but nothing can take the place of being there.

We missed some well-known faces. Let's plan now to be at Chicago in 1928.

A Tip to the Big Chief—No experience, no skill, no supervision can substitute for actual attendance at the A.P.H.A. meetings. You, Sir, cannot take home to your publicity worker or workers what he or they could gain through actual personal attendance and participation. And no other specialist in your organization so much needs this outside opportunity as do those who are doing any form of publicity or educational work.

We Were Too Popular—Too many nonmembers of Public Health Education Section attended the annual dinner-business session to make possible the intimate, informal discussion we had hoped for. The Section Council decided that only actual members of the Section will be admitted in 1928. So join now!

This Was Diphtheria Prevention Year—At the annual meeting. "The Story of the Campaign in New York State," the main speech of the Section meeting was made available in mimeographed form in advance of the meeting so that the time could be given to questions and discussion. The "Story" was a well-done chronological record of activities and publicity materials—an invaluable, understandable account of what has been done and what is proposed for the near future. Copies of the record and sample sets of the materials used will be supplied upon request by the Tuberculosis and Public Health Committee, State Charities Aid Association, 105 East 22d St., New York, N. Y.

The brief specimen talks and their discussion provided another stimulating feature.

One-third of the display space at Education and Publicity Headquarters was given to diphtheria material which was in charge of Mrs. Marie Kirwan, of the State Charities Aid Association.

In preparation for 1928, please send the editor three or four copies of every kind of diphtheria material you issue.

Making Your Own Slides—"1. Secure lantern slide cover glasses (3¼ x 4 inches) from any supply house. Cleanse each glass to be used with soap and hot water, then polish with a soft cloth.

"2. Mix a teaspoonful of cooking gelatine in a half cup of water. Soak it a few minutes in a small quantity of cold water before adding the hot. When thoroughly dissolved apply warm liquid to one side of glass, using a soft brush. Let dry in a vertical position, preferably over night.

"3. Trace the desired picture on the gelatine surface of the glass, using a medium fine pen and India ink. Allow ink to dry. Be careful not to touch gelatine surface with your fingers as you will leave finger prints. You can also write words (or print them) on these slides as you do on paper.

"4. The slide may be used unbound, but if it is to be kept for any length of time it should be bound. To bind it, place a mat (if desired) over the picture, then a clear glass cover. Bind as you would a picture, using lantern slide binding tape. A star or other mark should be placed on the lower left hand corner of the slide to indicate the corner which should be at the upper right in placing the slide in the stereopticon.

"Pupils enjoy making their own slides for various programs and lessons. The enthusiasm which is aroused by the projection of their own hand-work on the screen is surprising."—Home-Made Slides for the Progressive Teacher, by Chrystine Woodburn. *Educational Screen*, 5 South Wabash Ave., Chicago, Ill., Oct., 1927. 20 cents.

He Believes in Education — Discussing "The Part-time Health Officer's Problem of Coöperation with the Public Health Activities of Allied Agencies," Dr. Arthur Hieronymus says, "First—Education: By that I mean the education of the people in your district, physicians, city councils, city officials, boards of education and public service boards, to the fact that a health department is an important department in the city government. . . . Prove to everybody in your district that your department is an important one, and needs money and workers, just as other departments."—*Weekly Bulletin*, Calif. State Board of Health, Oct. 15, 1927.

Letters and Weeks and Other Matters—Special attention is given this month to Letters in the October–November issue of *News Bulletin*, Committee on Publicity Methods, 130 East 22nd St., New York. Other general headings are: "You Might Like to Send for These," "In Conference," "To Popularize or Not to Popularize." A copy of a recent issue *free* upon request.

Health at Illinois State Fair—"A number of new features attracted thousands of visitors to the health exhibit at the State Fair in August. A Bug House in which was displayed a bacteriological exhibit was especially attractive. It was constructed so as to appear old, dilapidated and in an all-round disreputable condition. Crowds thronged the aisle through it every day.

"Another new exhibit was a model showing how to sun-bathe babies. It was a dome shaped structure with an arc light representing the sun and cribs containing dolls for babies. One section showed a summer and one a winter scheme. It was popular with young mothers.

"An exhibit built of cut-out figures representing fifty years progress in public health service in Illinois was another interesting feature. These were additions to exhibit material which has been used to advantage heretofore.

"The annual baby conference enjoyed the usual popularity. A total of eleven hundred children were examined. Physicians from the Sangamon County Medical Society were generous with their services as were the nurses from St. John's and Springfield hospitals. This coöperation contributed materially to the success of the occasion.

"Superficial examinations of adults were also popular. About 4,500 persons availed themselves of the opportunity offered. This project was conducted by the Sangamon County Medical and Dental societies in coöperation with the State Department of Public Health. Its purpose was to promote a preventive consciousness in those who took the tests."—*Illinois Health News*, Oct., 1927.

The New Leaders—Ira V. Hiscock, School of Medicine, Yale University, is chairman; Marjorie Delevan, Michigan State Department of Health, vice-chairman; and John Sundwall, University of Michigan, Ann Arbor, secretary of the Public Health Education Section for 1927–1928.

Additional Section Council members are: Ray H. Everett, Philip S. Platt, and Evart G. Routzahn.

PRESS AND BULLETIN COPY

Good copy for a newspaper interview is contained in How the Community Can Aid the Health Officer, by F. G. Metzger. *Radio Health Talk No. 221.* N. Y. State Dept. of Health.

A monthly clip sheet on food, with special emphasis on milk is *Household Nutrition*, National Dairy Council, 910 South Michigan Ave., Chicago, Ill. *Free.*

WORDS

"In writing the general public in answer to complaints, inquiries, etc., technical service terms . . . should not be used, as in the great majority of cases they are not known to or understood by the general public. In other words, we should confine ourselves to everyday language in general use when corresponding with the public on postal affairs."—First As-

sistant Postmaster General to Local Postmasters, Oct. 15, 1927.

DATES AHEAD—JANUARY, 1928

1—New Year's Day
5—Twelfth Night
7—Christmas Day in Russia and other Greek Orthodox countries (foreign born)
17–23—Thrift Week—Address: National Council of Y.M.C.A., 347 Madison Ave., New York, N. Y.
27—St. Sava's Day—Serbian—Patron of schools and education (foreign born)
28–30—Child Labor Day—Address: National Child Labor Committee, 215 Fourth Ave., New York, N. Y.

ENGLISH MOTION PICTURES

"A Dangerous Handicap" is the title of a film produced by the Health and Cleanliness Council, 5, Tavistock Square, London, W. C. 1, dealing with the problem of domestic cleanliness. The story is of a young girl and a young man who play tennis together and are likely to become engaged. When she takes him home, however, the place is so dirty and slatternly that he gives up the idea of marrying into such conditions. The girl covers up her disappointment and sets to work with her mother to make the home clean. 10 minutes.

"The Leaflet," produced by the Dental Board of the United Kingdom in conjunction with the National Baby Week Council, 117, Piccadilly, London, W. 1, depicts the young expectant mother suffering intolerable pain from diseased teeth. She receives a leaflet pointing out the benefits mothers derive from attending the infant welfare center and she decides to go there herself. She sees the doctor who gives her advice and passes her on to the dentist who carries out the necessary treatment, to her great relief and comfort. The mother, having learned the importance of dental hygiene, decides to bring her baby up in better habits and to care for its teeth. The film includes some very attractive pictures of the baby and the toddler.

"The Risk of Diphtheria Banished" has been produced by the Welfare Department of the Mutual Property Insurance Company, 159, Great Portland Street, London, W. 1, with the help of medical officers of health in the London area. The film tells the story of the father who, having refused to submit any of his children to the Schick test, relents in the case of one child whom the school doctor points out as being particularly liable to catch diphtheria should she come into contact with it, because she is continually having sore throats. This child is therefore tested and immunized. The film goes on to show how, when the epidemic came, this child alone in the family did not fall a victim. The second section of the film shows the test being carried out on a large scale at Dr. Zingher's laboratories in New York (where the film was originally produced).

The above paragraphs from *National Health*, London.

OPPORTUNITIES

You may wish to send examples of health education material intended for children to Junior Red Cross Division, League of Red Cross Societies, and to the Red Cross in various countries. See under "Lists."

A Pamphlet Service is being developed by the National Congress of Parents and Teachers, 1201 16th St., N.W., Washington, D. C. "Many of these pamphlets are free. Others cost 5 to 25 cents." Price lists of a number of agencies will be supplied. The publications can be ordered direct or through the national office. "The National Congress is offering this service in order to have this literature available from one center, thereby obviating the necessity of writing to many different organizations." Those who have materials free or for sale throughout the country may wish to write Frances S. Hays, extension secretary.

POPULAR HEALTH ARTICLES

"One Up on Life," Jess Sweetser. *Collier's*. Sept. 10, 1927. "After winning some of golf's highest honors Jess Sweetser collapsed and faced his hardest, toughest round—threatened with tuberculosis. This is his own story of his greatest victory."

"Should Doctors Tell the Truth?" by Joseph Collins. *Harpers*. Aug., 1927. "A presentation of one of the most difficult questions that confront the physician."

TIMELY TOPICS

"A Daily Dozen." Press release. Oregon State Board of Health. April 19, 1927. Twelve health hints, most of them for daily application. Simple, practical, avoiding the suggestions frequently offered which many readers will not accept as being practicable or important.

Looking toward the winter holidays: "Fire Hazards of Christmas Celebrations." *Traveler's Standard*, Hartford. Nov., 1926. *Free.*

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B., DR.P.H.

Iowa **Suggests a Local Sanitary Code**—An outline of a sanitary code, suitable for cities and towns in Iowa, has been issued by the Department of Health of that state. This suggested code was prepared by James Wallace, M.D., C.P.H., who has done a good job, on the whole. In the 31 pages of the pamphlet the gamut of a sanitary code is presented and nothing seems to be omitted. The orthodox measures for the control of communicable diseases are set forth, but one provision with respect to the venereal diseases is worth comment. Article III authorizes the local board of health to cause a medical examination to be made of any person reported by a physician, nurse, social welfare worker, health inspector, or other authorized officer as suffering from a venereal disease or suspected to be suffering from such a disease. This is a drastic measure and in 1919 the highest court in Iowa denied the right of health authorities to make such an examination in the absence of statutory authority. Wragg v. Griffin, 170 N. W. 400, 2 A. L. R. 1327. Since the suggested code has a reference to the State Code of 1927 (Sections 2280–2316) it is probable that the legislature has since taken care of the matter.

In one or two of the articles, there are prefatory remarks or references which are not actually parts of the proposed code, or at least ought not to be. These should be placed in parentheses and indicated to be notes or explanatory matter. Except for a few minor defects, such as this, and the provision for control over plumbing by the local health authorities, the code outlined is a well balanced piece of work, which ought to be of considerable value to local officials.

A court decision in Iowa has recently held that the state may use municipalities or other territorial subdivisions to accomplish purposes of health legislation. Lausen v. Bd. of Suprs. of Harrison County, 214 N. W. 682.

More Health Laws in Ohio—A supplement to the 1925 edition of the *Ohio Public Health Manual*, which contains all of the many laws of interest to health officials in that state, has recently been issued. It has 46 pages and a good index. Among the new amendments is one referring to the State Department of Public Works, in which it may be observed that this department and not the State Health Department has charge of plans for sewerage, drainage, and plumbing of state institutions. Iowa please note.

Ohio has been having a lively time with a chiropractic referendum, which was due to be voted upon in November. There are now some 400 licensed chiros in the state, who are permitted to practice after they pass an examination in anatomy, physiology, chemistry, pathology, and diagnosis. They cannot treat infectious, contagious, or venereal diseases, use drugs or surgery, or sign death certificates. The referendum would have allowed any chiropractic graduate to practice this so-called profession without the formality of such a little item as showing whether he was qualified or not. It is to be hoped that the people of Ohio were intelligent enough to defeat this pernicious proposition.

The Medical Examination of Immigrants—A Chinese came to the United States, was passed by the medical examiners and was also found to be admissible under the Chinese treaty and exclusion laws. He was, however, remanded to the medical officers for a second examination and this time was discovered to be suffering from clonorchiasis, a dangerous or loathsome disease. Accordingly, he was denied admission, whereupon he sued out a writ of habeas corpus. This was denied by the Federal District Court, and on appeal, this action was upheld by the United States Circuit Court of Appeals for the ninth district. Gee Shew Hong v. Nagle, 18 Fed. (2d) 248.

The learned attorney for this Chinese gentleman contended that since his client had been medically accepted on one occasion, he could not be rejected on the next. This logic did not appeal to the court, which said in the opinion, "Surely it cannot be successfully maintained

that the immigration officers are bound to admit an alien known or believed to be inflicted with a loathsome or dangerous contagious disease, simply because a medical officer inadvertently or inadvisedly so certified." So the alien in question had to take his clonorchiasis back to China.

Good Laws Mean Less Smallpox—Where practical legislation is adequately enforced in favor of vaccination, there is less smallpox. According to a news release issued by the American Association for Medical Progress, Inc., on September 30, 1927, only 7 per cent of all smallpox cases are found in the group of twelve states where compulsory vaccination is legal. In contrast to this record, 24 per cent of the smallpox cases occurred in eight states where vaccination is in some way restricted. These facts and more are further developed in a recent pamphlet entitled "Smallpox Is Preventable" issued by this national lay organization which is doing so much for medical advancement. In the other states, where local health or school authorities are permitted by law to require vaccination at their option, or only when smallpox appears, no data are available from which generalities may be drawn.

A drugless healer who visits a case of smallpox must submit to vaccination or be quarantined, unless he has been successfully vaccinated within seven years, according to a recent decision of the Supreme Court of the State of Washington, City of Seattle v. Cottin, 258 Pac. 520. Of equal importance in this case was the ruling that a regulation of the state board of health was superior to a city ordinance which conflicted with it.

Prize for an Essay on "Scientific Property"—Legal pencil wielders will be interested to learn that a prize of $1,000 and a bronze medal are offered by the Charles C. Linthicum Foundation for the best essay on the subject of "Scientific Property," that is, the granting of a quasi-patent right to the discoverer of a principle of science. Two second prizes of $100 each are also available. To be eligible for the award, the author must be a member of the bar, a law student, or a patent agent. While there are not many lawyers in public health work, sanitarians usually have friends among the profession and may wish to call their attention to this opportunity. Further information may be obtained from the foundation at the Northwestern University Law School, 357 E. Chicago Ave., Chicago, Ill.

Miscellaneous Items—A surgeon in the United States Public Health Service is entitled to pay while on leave requested and granted as leave without pay, according to a recent decision of the United States Court of Claims, Trotter v. U. S., 62 Ct. Cl. 568.

In Massachusetts it has been held that equity will restrain further violations of health regulations, Town of Lexington v. Miskell, 157 N. E. 598. In this case, the keeping of swine without a permit was enjoined.

An assistant attorney general, George W. Davis, gave a radio health talk in New York recently. His subject was "State Aid for Afflicted Children."

The Seventieth Congress will convene by law on the first Monday of December. The vast number of bills relating to national health acted upon will, if space permits, be reported in this section.

A new book entitled *Federal Health Administration in the United States* by Professor Robert D. Leigh of Williams College has just been published by Harper & Brothers. This is a remarkably fine piece of work and will be reviewed at length later.

CONFERENCES

December 2–3, New Jersey Sanitary Association and Health Officers of New Jersey, Princeton, N. J.

December 5–10, National Council of Women, New York, N. Y.

December 8 and 9, Western Surgical Association, Omaha, Neb.

December 26–31, American Association for the Advancement of Science, Nashville, Tenn.

December 27–29, American Association for Labor Legislation, Washington, D. C.

December 27–30, National Community Center Association, Washington, D. C.

December 28, American Student Health Association, New York, N. Y.

December 28–30, Society of American Bacteriologists, Rochester, N. Y.

Kellogg's ALL-BRAN
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HEALTH DEMONSTRATIONS

in the

UNITED STATES

Supplement to the February, 1927, Issue of the

AMERICAN JOURNAL OF PUBLIC HEALTH

370 Seventh Avenue, New York City

AMERICAN experience with the demonstration method of forwarding public health is being woven from widely scattered projects of varying characters. The list would be long, including necessarily such undertakings as the recent demonstration of the National Tuberculosis Association in Framingham, Massachusetts; those of the Commonwealth Fund in Georgia, Tennessee, North Dakota, and Oregon; those of the Rockefeller Foundation in several southern states; and those of the Milbank Memorial Fund in rural, urban and metropolitan communities in New York.

Reflecting in part the experience from one or another of these projects, the accompanying papers presented at the Fifty-fifth Annual Meeting of the American Public Health Association* make a valuable contribution to current literature on the subject of health demonstrations. They were given at a session on *Health Demonstrations in The United States*, arranged by the following committee: *Chairman*, John A. Kingsbury, Robert E. Chaddock, Ph.D., Courtenay Dinwiddie, John A. Ferrell, M.D., Homer Folks, LL.D., Lee K. Frankel, Ph.D., Matthias Nicoll, Jr., M.D., Barry C. Smith.

The following papers were read:

The Philosophy of Health Demonstrations. LIVINGSTON FARRAND, M.D., LL.D., President, Cornell University, Ithaca, New York, *Chairman.*

Financial Aspects of Health Demonstrations. HOMER FOLKS, LL.D., Secretary, New York State Charities Aid Association, New York City.

Organization of Health Demonstrations. WALTER H. BROWN, M.D., Director, Marion County Child Health Demonstration, Salem, Oregon. Commonwealth Fund Child Health Program.

Discussion: C.-E. A. WINSLOW, DR.P.H., Professor of Public Health, School of Medicine, Yale University, New Haven, Connecticut, and BARRY C. SMITH, General Director, Commonwealth Fund, New York City.

* Held at Buffalo, N. Y., October 11–14, 1926.

THE PHILOSOPHY OF HEALTH DEMONSTRATIONS

LIVINGSTON FARRAND, M.D., LL.D., Fellow A.P.H.A.

President, Cornell University, Ithaca, New York. Chairman of Session

AS PRESIDING officer, I have been asked to discuss in an introductory way the philosophy of health demonstrations. While I am just as much puzzled to know what "philosophy" means as I was some thirty or forty years ago, there are a few things that I welcome the opportunity of saying.

It is not hard for anyone who has been dealing, as you all have, with the problems of health, the problems of vitality, and the problems of preventive medicine to appreciate why demonstrations, so-called, are necessary. It is true in practically every field of human activity that public appreciation and knowledge, public apprehension of truth, lag very far behind the expert discovery of truth. This is in no field more apparent than in that of medicine and medical science, where the most dramatic opportunities of the last century have presented themselves. I say that advisedly—even in the face of the enormous industrial developments that have taken place in the world as a result of discoveries in physical and chemical science.

Public appreciation of these discoveries of truth has been extraordinarily slow. Take, for example, the field of tuberculosis which has been the focus of our modern public health campaigns, as we call them. When Koch discovered the tubercle bacilli in 1882, there was an immediate apprehension on the part of the experts of the theoretical possibilities with regard to the welfare of man and the prevention of a disease made possible by that simple discovery. But it was twenty years before there began to be a public glimmering of appreciation, that expressed itself in action, and it has been forty years before we have begun to see a world-wide appreciation of the necessity of applying on a wide and more complete scale the lessons which were obvious, as I say, to the informed.

EVOLUTION OF PUBLIC HEALTH

Now, if we review the course of the public health movement, so-called, and look back on it with a perspective of, shall we say, twenty-five years, it is extraordinarily interesting to see how the emphasis has changed and how this change has usually been concomitant with the increase of knowledge, or the discovery of new facts, or the teachings of experience.

There was a period, as you know (and I don't speak now of the technical administration of health officers, because that is a point which I trust will be taken up later by others), when we felt that the great desideratum was the broad general education of the public, and I doubt if that idea has ever been lost. I think that many of us then felt that if we could simply get a certain number of facts into the minds of the public, that the problem would be solved. Great as were the advances made under this assumption, we found that it was not true. Gradually, we began to see the necessity of emphasizing this and that point more concretely, and after a period of such mass effort on a broad scale, we begin to see that we must concentrate on the application of certain of these truths to the individual. And as I view the situation, the striking difference between the public health effort of to-day and the public

health effort of twenty-five years ago, is our present insistence upon individual application.

The present widespread effort participated in by the medical profession and organized health workers of this country in insisting upon the periodical medical examination—what does it mean? It is a recognition that we can get nowhere unless we have the individual participation of those units that make up the population of the country. And it is perfectly sound philosophy. It is a perfectly sound theory. But as we are doing that, there still remain these general efforts which can be applied and should be applied in an organized way to the communities that make up the country. We have learned by stern experience that we cannot count upon the acuteness of the population or the natural eager curiosity of the general public to seize and apply these truths for themselves unless they are written in such lines that their lesson cannot be avoided. The consequence is the demonstration.

CONDITIONS CONTROLLING DEMONSTRATIONS

But, if demonstrations are to be established, there are certain facts that must be kept in view. First, we have to realize that in this country we are not dealing with a homogeneous population, nor are we dealing with homogeneous conditions. It is perfectly absurd to assume that laws, principles or habits which are applicable in the state of Maine, are applicable or can be made applicable in detail in the state of Oklahoma, the state of Texas or in Louisiana, or in any state of a markedly different population, climate or other condition.

The consequence is that there must be extraordinary care in choice with regard to the locality where a demonstration shall be established. And it was quickly recognized after the experience of Framingham, Massachusetts—chosen for the initial pioneer demonstration of this organized sort and conducted in a typical community of certain dimensions and certain characteristics in a state on the Atlantic seaboard—that one cannot apply lessons drawn from Framingham to communities in every part of the country. Certain factors, of course, will be common. There are certain lessons which can be drawn and applied, but there are many other experiences which cannot be so used.

Therefore, in broadening the application of the Framingham example, the first thing recognized as necessary is a careful and discriminating choice of the locality in which a demonstration should be established. There underlies at the same time an equally important consideration. If a demonstration is to be carried through, it is obvious that there would have to be financial resources greater than the proposed demonstration community could be expected at the moment to supply. It is also recognized, I think, that if a demonstration is to be of value, it must be made by the locality chosen, not by any outside agency, and that any assisting outside agency, or fund, with private resources of any sort, must necessarily consider themselves as simply coöperating in the project. It must be remembered that if they are to be made successful, we must never lose sight of the fact that these demonstrations are not private enterprises. If success is to attend the public health efforts of this country, those efforts must be public efforts. Any idea that a private agency can seize and conduct or usurp the health affairs of an American community, is a fundamental error. I do not think that that error has ever found place in any of the demonstrations with which I personally have been privileged to be associated.

QUESTION OF FINANCIAL EXPENDITURE

Now, granted these fundamental points, I think the next point to be realized is that there must be intelligence and conservatism exercised in financial expenditures for any demonstration under any auspices. If its significance is not to be

lost, it must be conducted on such a basis and on such a scope, that not only the demonstration community will assume the cost of its activities after the withdrawal of outside aid, but that similar activities can be undertaken by other communities of the type in which the demonstration is established.

On this point, as I have discussed it in past years, I have found a great deal of misunderstanding. What amount from public or private funds a given community is spending at the present moment for its health should not be confused with what that community can reasonably be expected voluntarily to expend, if and when it realizes and sees the possibilities of accomplishment with monies expended upon an adequate scale. The latter decision is not for any outside agency to make.

Conservatism in judgment is absolutely indispensable, but I wish to emphasize with all of the force possible, that conservatism is a very different thing from cowardice. If there is one thing that it is necessary to keep in mind, it is that the criterion of the amount which it is justifiable to expect any community to expend is not in any sense what is being spent at the moment. There is no community in the United States which from any reasonable point of view is spending an amount commensurate with the possibilities for the prevention of its preventable disease and for the improvement of its vitality with all of the advantages that accompany such conditions.

It is not, I repeat, for an outside agency to say that a given community shall spend fifty cents per capita per annum, or one dollar per capita per annum, or two or three or five dollars, as the case may be. Assisting in many thorough discussions before the establishment of any of these demonstrations, as to what was a reasonable amount for a community to spend for its health, I have never heard any person seriously suggest that an expenditure of two or three dollars per capita was an unreasonable amount to expect in the way of expenditure at some time in the future, when the community in question shall have realized the advantages to be obtained. I do not mean to say that there are not communities in the country where such a sum would be somewhat Utopian at the present time. What I mean is that many communities could easily spend such a sum and would readily spend it, if convinced of the benefits to be derived therefrom.

DEMONSTRATION OF PROVEN FACTS

The next point, and an extraordinarily difficult one always to keep in mind, has been that the demonstration should demonstrate proven facts. The demonstration is not a laboratory of experiment. There were many ideas, there were many lines of effort which were promising. There were many extremely alluring avenues of research and inquiry against which those of us who were concerned had sternly to turn our backs because nothing could be more unwise than to urge a community to assume, as a public charge, responsibilities dependent upon hopes or surmises or indications that were not definitely proved by the results of previously tested observation and experiment.

Another very necessary thing to keep in mind was that if a demonstration is to be of value beyond the particular locality in which it is established, there must be a degree of flexibility in its operation. One of the curses of our modern American life, with its necessary and inevitable insistence upon efficiency and economic advance, is an unconscious emphasis upon uniformity. There is the constant cry for standardization. Now, it is nowhere more apparent than in the field of public health that you cannot with confidence draw lessons from one place and apply them to all of the sections of the country. This being true, demonstrations, and enough of them, must be so established and adapted to conditions in different parts of the country that a mass of common facts will become available which may be applicable generally, and yet various enough to

permit their application by sections of the country having conditions peculiar to their own geographical regions.

DEMONSTRATIONS—COÖPERATIVE UNDERTAKINGS

Lastly, we must not forget that these demonstrations are primarily coöperative undertakings. We look to the health officials of the country for responsibility and guidance and operation in the protection of the public health and the building up of public vitality. However, the health officials of the country are dependent upon trained, educated, informed public opinion and upon adequate financial as well as legal provision to enable them to carry through the measures which they so clearly see. The day has not arrived when health officers can count upon public support, to enable them either financially or legally, to do these things unless they have the coöperation of organized unofficial effort. In fact, the value of such coöperation in attaining obviously desirable ends, is perhaps the most useful single thing that has been illustrated in these demonstrations.

The demonstrations have been established on a reasonably wide scale. There is a tendency always in the impatient American mind to demand results as soon even as a plan has been promulgated. There is great danger of forcing the preliminary steps. There is also very grave danger of drawing conclusions with regard to results before there has been time to accumulate a mass of knowledge, and time enough to have it adequately tested and seasoned by such checks as are necessary to assure its validity.

Many of us are convinced that these demonstrations are at the moment the great step forward in our public health program, but we are convinced also that the state of mind that is needed with regard to them, while never one of doubt or of lack of confidence, is distinctly one of conservatism and reserved judgment in speaking of what should be done by way of applying the lessons of these undertakings in any given community.

It is my very great privilege to present as the next speaker a man who has from the earliest days of the organized public health movement been intimately associated with its every phase. I present Mr. Homer Folks, who will discuss that fundamental point, "The Financial Aspects of Health Demonstrations."

FINANCIAL ASPECTS OF HEALTH DEMONSTRATIONS

HOMER FOLKS, LL.D., Fellow A.P.H.A.
Secretary, New York State Charities Aid Association, New York City

THE SUBJECT assigned to me is money — the Financial Aspects of Health Demonstrations.

The most constructive personality we have ever had in public health work in New York City and State wrote these words, which were read in every community in this state: "Public Health Is Purchasable."

The financial aspects of a health demonstration may be very concisely stated as an exploration of the terms and conditions of that proposed purchase.

What kinds of health are now on the market? What is the price of each one? How much cash do you have to pay down? Can you buy health on the installment plan? How soon can you expect delivery after the order is given? How sure can you be that the goods will meet the specifications of the contract? Are the goods worth the money? Is the investment a sound one? What rate of dividends may you expect on the investment, and how soon will it begin to pay dividends?

These and a score of other similar questions that each of you could ask constitute to my mind the financial aspects and the financial objective of a health demonstration.

HEALTH IS PURCHASABLE

It is to be observed that Dr. Biggs did not say that health *services* are purchasable. He said that health is purchasable. He did not say that one can buy health laboratories, or health literature, or nursing services, or exhibits. There would have been no news about that. Everybody knew that. No newspaper in the state would have published that statement. But they all published his other statement repeatedly. He made the bold leap from services to results. He staked his reputation on the assertion, publicly broadcast, that if money were invested in health services, mortality and morbidity would be reduced from what they otherwise would have been.

It was a bold statement but it worked, and states and cities gave moderate and cautious orders for health on future delivery. They seem to have been satisfied with the results, for to the best of my knowledge all of those who gave an order have continued and increased their orders and none of them have quit.

But, after all, those orders for health were rather limited in variety and in amount and the question now is, "What further purchases of health are now in order?"

HOW MUCH HEALTH SHOULD BE BOUGHT?

One approach to that question is, "How much health is any community likely to continue to purchase over a series of years?" It is frequently suggested as a determining factor in the amount of money which should be expended in a health demonstration over a limited period that no community should incur, or be assisted in incurring, any expenditure for health purchases in excess of the amount which it will be expected to assume and be able to assume regularly and permanently thereafter.

With certain qualifications this general principle may be accepted—but the qualifications are exceedingly important. Here are three of these qualifications:

I. REAL OBJECTIVE OF A DEMONSTRATION

A health demonstration is not intended, primarily, so far as those giving outside aid is concerned, as a benefit to the people of that one locality; it is intended to benefit the people of many localities through what that particular locality may learn, or, in current phraseology, may demonstrate. A health demonstration is the more complete application of present knowledge about health. it is in that sense an experiment administratively and financially. It follows then that the fundamental test, when the record is complete, is not, *Did the community take it over?* (although that is an important test) but, *Was anything demonstrated?* Was something learned by the more intensive application of present-day knowledge to present-day conditions of human life, as to how much sickness and how much premature death can be prevented; how greatly human well-being may be promoted by the fuller application of present knowledge. If, when the experiment is finished, nothing new has been proved; if no example has been set which will be of value to other localities, or which even might simply save them from expending money and effort in fruitless ways then the demonstration has been a failure. On the other hand, if it has been conclusively shown that certain additional investments in health will bring definite and valuable results at a given cost, the demonstration has been a success.

It is even conceivable, though not likely, that a demonstration might be exceedingly valuable and highly successful as an example to other localities of what can be done, even though that particular locality for some reason did not continue that particular health investment. In fact, there are some health demonstrations which have been undertaken without any expectation that the localities would incorporate the activities established by the demonstration as part of their permanent health work. They are akin to laboratory investigations of questions of cost and administration—not laboratory studies in the technical sense, but researches in the field of costs and of methods of operation.

For example, the East Harlem Nursing and Health Demonstration in New York City was undertaken in this spirit. It was an experiment in the unification of nursing activities in a limited area and as to the results and costs of nursing service. In adjacent areas under the same conditions generalized and specialized intensive public health nursing was carried on under the same control. It was shown, for instance, that the cost of a home visit by a nurse under the generalized plan was $.89, and under the specialized plan $1.25, and that the most rigid tests practicable indicated that the social values of the generalized plan, although it was materially less expensive, were superior. It was shown also that the average cost of public health nursing service for one person during the entire period of his care was $7.20, and that it varied from $3.54 for public health nursing service for a school child to $17.70 for a postpartum case. Bearing in mind that public health nursing service is the largest factor in modern public health administration, involving larger costs and a larger staff than any other factor, this experiment or demonstration as to generalized and specialized nursing is of the highest significance in the development of public health work everywhere. It was a very satisfactory exploration of the terms and conditions on which public health nursing may be purchased and of what may result therefrom.

Similarly, for the first time, we now know that in a rural area like Cattaraugus County, New York, under a similar public health nursing system on a generalized plan, the cost is more than twice as much, nearly $2.28 per visit, as against $.89 in East Harlem. Later years with a larger nursing staff will probably considerably reduce this earlier unit cost in Cattaraugus County. Analyzing the increased cost in detail and comparing it

with East Harlem, it is shown that the increased cost in Cattaraugus County is almost wholly in transportation. In other words, we now know that the people of rural communities, in order to secure a public health nursing service of equal efficiency to that provided in a congested city area, must pay twice as much for it—the cost of getting the nurse to the patient being the largest factor in the excess. This high cost of getting the nurse to the patient may be considered as in itself a full justification for the state sharing with the locality the cost of rural health work on a fifty-fifty basis. In Cattaraugus County the nurse's visit to a school child was the least expensive, being $1.95, and the prenatal and postpartum visit the most expensive, being $3.04. We also now know that in a rural area like Cattaraugus a tuberculosis clinic as carried on there with competent diagnostic service, with suitable facilities, and with adequate nursing service will cost $74.53 per session; that prorating the costs of the entire clinic service to the actual number of tuberculosis cases discovered, the cost is $38.61 per case of tuberculosis discovered; that prorating the cost on the number of persons examined, the cost is $3.59 per examination. Here, again, transportation is a very important factor in the cost. We also know that in this rural county, where under previous conditions with an ordinary tuberculosis service there were about 135 tuberculous persons recognized, and either in hospitals or under home care, you can find in two and a half years at the average cost above noted a total of 538 patients, including both active cases and those whose tuberculosis has become inactive but, nevertheless, still requires certain precautionary observation.

Such facts as these are of great value obviously not only to Cattaraugus County, but to all other similar localities which look forward to dealing with the prevention of tuberculosis and the development of public health nursing on a more adequate basis.

II. COST OF CORRECTING ACCUMULATED HEALTH DEFECTS

A second qualification of the general principle of limiting the cost of health expenditures of a demonstration to what is likely to be taken over by a locality, which has assumed increasing importance in my mind, as a result of the work in East Harlem and in Cattaraugus County, is this—that in an area in which little health work has hitherto been done, there is an accumulation of bad conditions which involve much greater costs for a few years while they are being cleaned up, so to speak, than will be necessary subsequently in dealing with the annually recurring load. To find 550 cases of tuberculosis in Cattaraugus County, for example, involved a much higher cost per annum than will be necessary for finding such cases as will currently arise in later years. In the first really careful physical examination of all the school children of a community, there are found an enormous number of diseased teeth, enlarged adenoids and diseased tonsils, which represent an unrecognized and uncared for accumulation of a period of years. If 50 per cent of these conditions are corrected within a year or two (and something like that has been done in Cattaraugus County), the cost of such corrective work will be much greater during that year or two than in later years. In Cattaraugus County where there had been no special prevalence of infantile paralysis and where nobody expected to find any considerable number of crippled children, a careful survey brought to light more than 150 crippled cases (some 30 of whom were, in fact, adults). An effort has been made to give each of these cases careful diagnosis by a competent specialist and to provide for each of them the particular kind of operative or other treatment needed, even though this has meant, in a number of cases, one or several trips for operative procedures to Buffalo or New York City. The annual expenditure for such work is obviously enormously greater during this period than it will

be in subsequent years in dealing with the usual annual increment of crippled children.

East Harlem, especially, has impressed upon me one very important aspect of the cost of an adequate public health nursing service in its earlier years, as compared with later years. A nursing service in giving the first "once over" to such a population as that of East Harlem is dealing, so to speak, with a virgin field so far as public health education is concerned. One has to begin absolutely at the beginning. It takes time and repeated visits to produce any permanently useful effect. None of us begin to realize, as yet, I think, how greatly this problem will be changed when we deal with a generation who have been through the public health services now attached to schools, and who have received the instruction in regard to health which school children now receive. Not only will many faulty conditions have been corrected, but there will be quite a different and an enormously more receptive attitude toward health teaching and health programs. The problem will be enormously simplified and the expenditures necessary to accomplish equal results will be diminished. It may well be that we will wish to go on to obtain still further results, rather than reduce cost, but if so, we will have a great deal more to show for every dollar expended. Summing up our second qualification—it costs a great deal more, as every farmer knows, to take out stumps and to break up new ground, than in later years to plow and harrow the soil.

III. INITIAL COST GREATEST

There is a third important qualification to the general principle which we have accepted. A health demonstration is, in a sense, a pioneer undertaking, an experiment—and pioneering and experimentation always cost more money than established procedures. You have to have more expert direction and a more careful measurement of progress, as, in effect, an insurance against failure. The thing that is once fully established and that has become routine is, of course, less expensive than the things which must be watchfully safeguarded at every point against unknown and then unknowable factors.

In the light of these three qualifications we may revise our general principle as to the rate of expenditure which may properly be incurred in a health demonstration something as follows:

For current activities which may be expected to arise year after year there should not be incurred in a health demonstration greater sums than a community can reasonably be expected to carry indefinitely. In addition to this and temporarily, there must be assumed excess cost of new fact-finding, of cleaning up accumulated evils and of expert service as insurance against failure.

FINDING HOW MUCH HEALTH A COMMUNITY CAN AFFORD

But the question at once arises, How much can a community afford to pay currently for health, year after year; how much health can a community afford to buy? We occasionally hear this comment on a health demonstration, "It is interesting but it is so expensive," or that it is "too expensive." This does not get us any farther ahead until we define what we mean by "so expensive" or "too expensive." We must first arrive at some standard by which we shall judge what is to be considered a reasonable expenditure for health and what must be regarded as impracticable and beyond what an ordinary community can afford to pay. We might not agree, out of hand, as to what is a reasonable per capita health expenditure, but I think we might all agree on certain steps and considerations by which we could approach an answer to the question.

MEASUREMENTS FOR HEALTH EXPENDITURE

I think of some six measurements or tests or stages in arriving at an answer to the question, What is a reasonable health expenditure?

1. As Dr. Farrand has already indicated, present expenditures for health in any locality are no criterion as to what would be a reasonable health expenditure, and what may reasonably be contemplated as a very probable health expenditure within a few years. The proof conclusive of this is the fact that our present expenditures for health would have seemed 10 years ago to be utterly preposterous. Ten years ago such a thing as a Christmas seal sale in New York State outside of New York City of half a million dollars per year, a State Department of Health with an annual budget of almost a million and a half dollars, and 35 tuberculosis hospitals in New York State outside of New York City carried on with an annual cost of about a million four hundred thousand dollars, would have seemed to even sanguine and hopeful people to be far beyond the range of the attainable within a period of a decade. Certainly they would have been put down at that time as "so expensive" or "too expensive"; yet they have been brought to pass without extraordinary difficulty and certainty. The state and its communities are none the worse therefor.

2. It will be agreed also, I think, that what one or more communities are already expending for health without any particular economic strain cannot *ipso facto* be put down as impracticable, or even improbable, for other similar localities under like conditions. The presumption would rather be that what any one community has shown itself able to do, any other comparable community would also be able to do.

3. A third factor is that health is still a very small part in the entire budget of any locality or of any state. There can be a great percentage of increase in health costs with only a very slight percentage of increase in the total budget. That is very close to the essence of the situation as to the practicability of substantially larger health expenditures. We must not be too apologetic, too much on the defensive. We must always keep in mind the fact that the essence of salesmanship is confidence in one's wares.

4. Another indication as to what people can afford to pay for health, and a most pertinent one, is the present cost of the illnesses which it is proposed to prevent. Dr. Dublin has recently told us that the average cost of sickness per capita per annum throughout the United States exceeds $21 per year. No one knows, I presume, how much of that is preventable, but certainly a very substantial part of it is preventable. The Chemical Foundation tells us that the per capita per annum drug bill of the United States is $5, of which $3 is for patent medicines. I suppose no one would seriously question the statement that it would be advantageous for every community in the United States to buy $3 worth of health per year per person, rather than to buy $3 worth of patent medicines, and $3 worth of health per year is the maximum sum which I have heard seriously discussed as a desirable present per capita per annum health expenditure. Speaking roughly, any community which expends the average amount on patent medicines could afford, without increasing its total expenditure, what we now regard as a comparatively ideal health service by the simple expedient of not buying patent medicines. A moderate expenditure in public health education would contribute toward this result.

5. Another fact which must be borne in mind in measuring ability to pay for health is that ability to pay is not fixed and stable but is a variable factor. It depends upon numerous considerations, one of the most important of which is, in reality, how much the community has previously expended for health. A community with a high average of health has a greater ability to pay for more health than one in which there is a high percentage of sickness and lowered vitality with low productivity. It is granted that a community which is riddled with tuberculosis, in which typhoid rates are high, in which many mothers die from puer-

peral causes, in which people walk about with their mouths full of decayed teeth, their throats blocked by enlarged adenoids, and with tonsils reeking with infection, is in no position to pay heavy taxes. It truly is in a bad way. It is in the grasp of a vicious circle—poverty creating sickness, and sickness accentuating poverty. The quickest way to increase its tax paying ability is by hook or crook, by any and all practicable means, to begin to clean itself up, to spend something on health. It must substitute a beneficent circle in place of a vicious one. Health will create wealth, and wealth, permitting a higher standard of living, will further increase health.

6. Another important consideration in estimating potential health expenditures is that we must not too readily base our arguments on the experience of one state as compared to that of another. Within the wide range of these United States there is a wide variety of rural conditions as well as of urban conditions. We often speak of general prosperity, but is it ever general under such wide variation of underlying conditions? When some are up, others may be down. They will not always rise and fall together.

PER CAPITA INCOME AND HEALTH

There has recently become available for the first time an actual study of income per capita in the various states of the Union in the years 1919, 1920 and 1921. It is an extremely interesting report and has a very direct bearing upon our problem. The variation in per capita income is striking. Selecting a few states from different points of the country, the per capita incomes in 1919 and in 1921 are as follows:

	1919	1921
New York	$897	$921
Texas	515	433
North Dakota	517	317
Indiana	548	465
Wisconsin	559	504

It is obvious that a state in which there is a per capita income of $317 is not able to expend as much for public purposes including health as a state in which the per capita income is $921.

The report also gives the income for the farm and for the non-farm population. The difference between them is rather less than I had expected, in view of the accumulation of wealth in the great cities. For instance, in New York, an excessively urbanized state, where the average per capita income in 1919 was $897, the average per capita income of the farmer was $537, and that of the non-farmer $928. The farmer, obviously, had not the same amount of ready cash to expend for health or anything else as had the urban dweller, but here the state comes to the rescue and more than makes good the difference by carrying 50 per cent of the load for health expenditures by rural counties.

The year 1919 was rather a peak in the matter of income and there was a great slump in 1921. It is interesting to note that even among farmers this slump was very unequally distributed, being much greater in certain states than in others. Taking the same states as above and considering the farm population only, the degree of slump 1919 to 1921 is as follows:

New York	$537 to $470
Texas	360 to 171
North Dakota	518 to 187
Indiana	371 to 135
Wisconsin	463 to 359

Before entertaining and certainly before expressing any dogmatic opinion as to what any given state can or cannot do in regard to health by reason of what some other state has been able, or has not been able to do, one should very carefully study this report on *Income in the Various States* published by the National Bureau of Economic Research in 1925, whose headquarters are in New York City.

ACTUAL DEMONSTRATION COSTS

It would be extremely interesting, time and space permitting, to apply each of

the foregoing 6 considerations to the actual expenditures for health in the various localities from year to year, in which there have been health demonstrations and also to other localities. We must never forget that other localities have not stood still, and that when we think of the increase in health expenditures from local sources in a demonstration area, we must not assume that otherwise they would have stood still. It was my original intention to elaborate this paper at this point with a detailed analysis of the cost of each health demonstration from year to year and of what has taken place since the end of the demonstration period, where the demonstrations have terminated. I am obliged to do so much more summarily and fragmentarily than was my original intention. At Framingham, Massachusetts, you will recall that the total expenditures for health purposes, public and private, increased during a period of 5 years ending in 1921, to about $2.00 per capita from local sources and $.40 from outside sources. The significant thing is that while this was a very large increase in terms of percentage, it was not a large increase in the total budget of the locality. It was gradually assumed year after year with no special difficulty, and wholly without any sense of doing anything unusual and certainly without any sense of excessive strain or extravagant expenditure. The higher cost of $2.40 per capita per annum was borne as comfortably, and with no more criticism, than the minimum cost at the beginning. It is in the nature of the tax payer to object to all taxes, in all places. It would be strange if it were not so. Probably the most significant fact of all is that after the end of the official demonstration period, 1921, the official expenditures for health continued to increase from about $21,500 in 1921, to $35,000 in 1926, an increase per capita of about $.65, thus more than equalling the outside participation in 1921.

In the original planning of the three New York health demonstrations, Cattaraugus County, Syracuse, and the Bellevue-Yorkville District in New York City, very careful and extended consideration was given to the question of how much these localities could reasonably be expected to assume and carry permanently after they had received help from the Milbank Memorial Fund during a demonstration period of 5 or more years. It was felt that in the light of Framingham and in view of increased costs, especially in a rural district, for transportation, it would be entirely practicable, and in fact conservative, to look forward to the possibility of a per capita per annum expenditure for health, public and voluntary, of some $3 per capita per annum. A health service has been built up in Cattaraugus County and in Syracuse far in advance, particularly in the county, of that which exists, as yet, in other comparable localities. At first thought one might consider the nursing service in Cattaraugus County as probably quite expensive. The important fact, however, is that neither in Cattaraugus County nor in Syracuse, including all expenditures for health, official and voluntary, local and state aid, the sum regarded at the outset as a reasonable per capita expenditure has not yet been reached. If we exclude from the present expenditures in Cattaraugus County about $2.75 per capita, the unusual items mentioned earlier in this paper—cleaning up an accumulated load of evils, the study of costs and methods, and special personnel to insure results—the balance representing essential current health services (exclusive of hospitalization) would be about $2.40 per capita. If the people of Cattaraugus County were carrying the whole load to-day for the essential current health work that is going on there, they would be paying somewhat less than the people in Framingham, Massachusetts, are now paying per capita. We might even look forward, therefore, to a considerable further development of ordinary health service in Cattaraugus County in the near future without contemplating a

higher cost than the total now being spent.

Without entering into further details, which time and space do not permit, I will merely note that the per capita per annum costs in Mansfield, Ohio, fell below those in Framingham, Cattaraugus County or Syracuse. None of them is approaching the figure which we originally had in mind as practicable for the New York demonstrations, which, it happens, is exactly the per capita per annum expenditure for patent medicines according to the Chemical Foundation.

The net result on my part of my study of this set of facts and of my thought in the preparation of this paper has been to me a quite unexpected one. At the present time, instead of thinking of a per capita per annum of $3 for health as practicable, though difficult to attain, as representing a maximum, I am now thoroughly convinced that in our original consideration of this subject we undershot the mark. I am now clear, not only that it is practicable to purchase health in larger amounts, but that in many localities in this state and elsewhere, the people are going to make that investment within a reasonably short period and without any very special difficulty. During the past decade health expenditures have increased by leaps and bounds. I am convinced that the people are satisfied with the results and that a reasonable degree of leadership in acquainting them with what they have received in return for their investment will convince them readily of the desirability of still further and still larger investment in so paying an enterprise as public health.

Chairman Farrand — Mr. Folks has presented with characteristic clarity this very fundamental question which underlies the whole theory of health demonstrations. He has suggested a number of additional points for discussion.

I spoke a little earlier of the fact that these health demonstrations were really demonstrations in coöperation. It is obviously necessary, if success is to be achieved, that the health officials must have the support of various elements in the community. I did not at that moment stress what, of course, we all realize as a primary factor in any successful health effort, and that is, the coöperation of the medical profession, and in the organization of a health demonstration that point must necessarily be taken into account. Having watched Dr. Brown a good many years and reasonably closely, whether as commissioner of health in an American community, or as the head of the health service of a great voluntary organization, or later as the director of one of the most carefully thought out child health demonstrations, namely, that in Mansfield, Ohio, or now as the director of the latest of these child health demonstrations—which has the advantage of the experience of others and his own included—I am pretty sure that in discussing the organization of a health demonstration he will not be able to avoid taking up this point of coöperation, which is possibly equal or certainly second only to the financial aspect of the problem.

I now have great pleasure in presenting Dr. Walter H. Brown, who is at this time the Director of the Child Health Demonstration in Marion County, Oregon.

ORGANIZATION OF HEALTH DEMONSTRATIONS

WALTER H. BROWN, M.D., Fellow A.P.H.A.

Director, Marion County Child Health Demonstration, Salem, Oregon
Commonwealth Fund Child Health Program

THE GROWTH and popularity of health demonstrations marks an interesting chapter in the story of our quest for newer and more effective ways of prolonging life; and now happily, also, for influencing its quality. The demonstration idea has in it all the dangers and difficulties inherent in an attempt to change the habits of thought and action of communities and individuals. The dangers lie chiefly in the possibility that by the use of unsound technical or social methods, serious damage may result to the community and to public health. The difficulties are due, most frequently, to the delicate character of the relations involved in any attempt by an outside group to influence local practices or procedures. The growing recognition of these factors by the sponsors of such projects has been one of the striking developments in the use of the demonstration method.

It has been interesting to trace the evolution of the demonstration as a method in the health field. One can see its forerunner in the earlier work of the United States Public Health Service. Calls for assistance by local communities to meet the emergencies of epidemics gave the leaders in this Service a vision of the dire need for some method of inducing these communities to provide better health protection on a permanent basis. This led, naturally, to the practice of loaning trained personnel to selected communities for demonstration purposes. The success of this method was followed by the coöperative plan for the development of county health units. This plan has made and is making an important and valuable contribution to our knowledge of how health service can be made available for rural communities.

The next important development was the establishment of the Rockefeller Sanitary Commission. In thinking of the striking and dramatic work of this commission, we are prone to overlook its larger significance, because it marked the beginning of coöperation on a large scale of the voluntary health organizations with governmental agencies. Through this method of coöperation, these organizations are attempting to discover whether there is a sound way by which private initiative and funds can be used to hasten a better public health day.

The Sanitary Commission was reorganized and became the International Health Board. It made successful attacks upon hookworm, malaria and yellow fever. These demonstrations accomplished the dual purpose of controlling an individual disease, and awakening the local communities to their responsibility for permanent health machinery. Further, they stimulated other groups of workers and organizations to consider the possibilities of the demonstration method.

PURPOSES OF SPECIFIC DEMONSTRATIONS

The Framingham, Massachusetts, Tuberculosis Demonstration explored the field from new angles. It aimed to determine how much it would cost to reduce the mortality from tuberculosis to a minimum in a local community in a given time. As part of its program it gave recognition to the growing importance of coördination of all the agencies whose work influenced the health of the com-

munity. To know the unit costs of production and distribution is one of the fundamentals in any enterprise whether this be the manufacture and distribution of Fords or the "selling" of a health program to a community. Such cost data acquired from carefully controlled sources over sufficiently long periods is essential in passing judgment as to what a community can and should expend for health.

The establishment of the Child Health Demonstration at Mansfield, Ohio, marked another stage in the development of the demonstration idea. Born out of the purpose of the National Child Health Council to find an effective method for coördinating the activities of its member organizations, it introduced a number of new elements into the method. This council endeavored to secure the best opinion on all aspects of child health procedure from the various specialized groups, and through organization make as much of it available for the local community as possible.

Several things come into the foreground of the picture presented by the Mansfield Child Health Demonstration. The educational authorities became full participating members in the health alliance between the outside agency, health authorities, and local voluntary health groups. One of the major efforts was devoted to exploration of the ways by which the health resources of the medical and dental professions could be related to a health program, with due regard for the ideals, rights and privileges of these professional groups. Finally, efforts were made to test out the technic of promoting the kind of community organization which would insure intelligent public opinion on health matters and assure permanent support and further increase of the health facilities to meet the changing needs of the community.

With the entrance of the Milbank and Commonwealth Funds into this field in 1922, we arrive at the present stage in which the health demonstration is being tried out on an intensive and extensive scale, backed by sufficient funds and conducted by trained and experienced personnel. The application of the idea is now being made under a great variety of social, political, and economic conditions. These two organizations have approached the problem independently and from somewhat different points of view. While one approaches the health problem by emphasizing tuberculosis, the other emphasizes the health of children from the prenatal period through adolescence. They both are attempting to attain their objectives through the development of a general health program with emphasis on the specialized services. There is practical agreement in their policies of coöperation with local governments and in their methods of financing the projects.

OBJECTIVES AND POLICIES OF COMMONWEALTH FUND PROGRAM

It is not the purpose here to compare the details of these health demonstration programs, but rather to point out what seem to be legitimate objectives and sound policies which should govern the organization and operation of any demonstration. The Commonwealth Fund Program is attempting to profit by the past experience of all the workers in the demonstration field in translating these policies and objectives into a well rounded functioning program.

The main objective of these demonstrations is:

To expend wisely, not extravagantly, sufficient funds in an effort to determine how modern health service can be secured for the average community.

In attempting to reach this objective it is believed that the operation of the demonstrations should be governed by the following:

To reinforce, not to usurp, the functions of governmental agencies

To build up, not to tear down, the already established voluntary health groups

To advance, not to retard, the development of the medical and dental professions

To promote a well rounded health program based upon scientific fact, not on emotion

To persuade, not to coerce, the local community to adopt and support such methods as prove of real value

Finally, as a contribution to the science and art of public health, to evaluate accurately and record frankly the whole project

These objectives and policies have been shown to be necessary and desirable. They are in harmony with the principles of local self-government. They adequately protect the rightful interests of professions and organizations. With these policies it is possible for any reasonable assistance to be rendered a local community by outside sources. They will permit a sufficiently wide latitude of experiment in methods and distribution of results without exploitation of the community.

There will be little divergence of opinion upon this statement of principles. But there may be considerable, when we come to discuss the broad question of method as applied to demonstrations.

On the one hand, we have the plan which limits coöperation to governmental agencies; places all public health measures except those for the immediate control of preventable disease in a place of secondary importance; and provides for a minimum budget upon which it is possible to operate a health program. The theory underlying this plan is that the demonstration of health procedure, as applied to a single problem or on a small scale, will induce the community to acquire the habit of appropriating sufficient funds for health purposes.

On the other hand, we have the plan which involves the coöperation with official agencies but also adds the voluntary groups; includes in its conception of public health not only disease prevention but health promotion; and provides for a sufficient budget upon which to operate a complete health service. The theory upon which this method is based is that the American people will adopt more readily and intelligently what they see actually in operation. In our country there must always be great flexibility of plan to permit proper adaptation to local conditions. My plea is for an open minded trial of both of these methods and an evaluation in the scientific spirit.

SELECTION OF COMMUNITY IMPORTANT

The selection of the community for a demonstration takes rank in importance with the soundness of method and program. The plan of selection has been to adopt a set of requirements and to send out invitations to all communities coming within the specified population and geographical units. By a study of public records, questionnaires and visits of representatives, the selections are made by elimination. This plan has been measurably successful but it has certain inherent weaknesses. It is almost impossible to judge accurately the spirit of a community in a short time. To make a correct diagnosis of the important community characteristics is no easy task. The success of the undertaking may be jeopardized by social, religious, and political conditions.

It is most difficult to make clear to local groups the objectives of the demonstration during a short visit for survey purposes. This is particularly true of what is to be the local responsibility. It is natural for a community to put its "best foot" forward, especially when it seems to progressive groups that there is a chance to secure something that will benefit their home community.

The meeting of these conditions by demonstration workers has given rise to a body of experience which should be valuable to all health workers. Out of this experience it may be said that the actual conditions, learned only by residence within the community, must govern the character and rate of development of the demonstration activities. This means that an inflexible program, no matter how perfect or desirable, is impossible. The first principle of demonstration organization is a sincere and careful adaptation to local conditions.

SOURCES AND AMOUNT OF BUDGET

We next come to a consideration of the sources and amount of the budget. Everyone seems to agree that there should be participation by the local community. The difference of opinion seems to revolve around the relative amounts. It would appear that the amount of the participation is not nearly so important as whether it is made by proper representatives of the community and with an intelligent understanding of the responsibility for increases based upon agreed conditions.

When it comes to the amount to be spent for health purposes, we are in no position to say how much a community should or will pay for health service. No American community has lowered the death rates from communicable diseases to an irreducible minimum—to say nothing of raising the level of vitality of the population to its maximum. One of the reasons why public health practice lags so far behind public health knowledge is our niggardly appropriations for health. The most superficial study of our health budgets will bear out this statement. Practically all health workers agree that one of the first requisites for further advances in the public health program is increased funds. To secure these funds will require the development of some better ways for creating sufficient public sentiment for adequate community health programs.

How much should a community spend on health? Should the appropriation be equal to those for education, fire, and police protection? No exact figure can be stated. But it would be a sound public policy to base health appropriations upon the health needs of the community and the effectiveness of methods being used to meet those needs. It is in this field of determination of costs and effectiveness of public health measures, that the demonstrations are making one of their largest contributions to public health.

The creation of a community desire for health is a complex and delicate problem. It requires careful, patient, scientific work, and this costs money. One hears little criticism these days of the large amounts of money needed to maintain research work either in industry or in science. The demonstrations are acting as research stations for the discovery of improved methods of community organization for health. As such, they justify an expenditure of funds considerably above what will ever be supported by the community.

SELECTING A STAFF

The careful selection of the staff is another important element in the organization of the demonstrations. A demonstration which involves a more than ordinarily close integration of the different branches of health service and attempts to build upon a foundation of intelligent understanding and support on the part of citizens requires a high type of personnel. Its workers, although specialists, must have a broad grasp of the problems of health and of education. They must also have the rare ability to become temporarily a real part of the community. The community cannot be expected to take over this personnel after the program has once been demonstrated. This has led to a consideration of practical methods of training personnel from the territory to be served by the project. Consequently, one of the important by-products of the demonstration program has been an affiliation with established educational institutions in order to assure a continued supply of trained personnel to carry on permanently the program established by the demonstrations.

THE PROGRAM

In considering the program, it may be profitable to emphasize several points which experience has shown to be important in the organization and operation of the demonstration: The character and extent of the proposed program, the rate of its promotion and its relationships to the local organized groups.

The character and extent of the program will be governed by the objectives and policies of the sponsoring organization. It will be modified by the amount of time and funds available. It must be decided whether the demonstration is to be conducted as a generalized or specialized health program. The choice of method will modify the plan of organization. Whatever the choice, success will largely depend upon the next point, the rate at which the program is promoted.

The rate of promotion is of equal importance to the soundness of the program. Many essentially useful and desirable health procedures are rejected by communities because they are attempted without sufficient community preparation. Premature health projects have as high a mortality as premature babies. The rate at which our program should be promoted must be based upon the stage of development in which we find the local community—not upon the time at which the demonstration is to terminate.

The most difficult and important element in our organization problem, however, is the relationships with the official, professional, and social groups. To help a community help itself; to work actually and whole-heartedly with the established agencies; to respect the ideas and ideals of the professional groups; to subject one's work to the acid test of community approval and accept the verdict. These make up a creed of relationships which try the souls of the most high minded health workers. Yet they must be carried out if the health demonstration is to prove an effective means of promoting the cause of public health.

MARION COUNTY DEMONSTRATION

The description of a particular demonstration will bear out these observations. The Marion County Demonstration is one of four regional demonstrations of the Commonwealth Fund Child Health Program. The general objective of this program is to discover successful methods for improving child health, through a general community health program, particularly in the smaller units of population.

Marion County is located in northwestern Oregon, in the Willamette Valley—fifty miles south of Portland. The population of 53,000 is distributed in two cities, seven incorporated towns, and a wide expanse of farming country, extending from the Willamette River on the west to the foothills of the Cascade Mountains, 45 miles on the east. Practically any part of the county may be reached over a system of good roads. Salem, the county seat and state capital, is the headquarters of the demonstration. It has a population of 23,000.

The population is made up largely of native born Americans with only a sprinkling of Chinese and Japanese, and practically no negroes. The predominating industries of the county are specialized fruit farming, lumbering, and the beginnings of industrial development of linen and paper mills.

In selecting Marion County for the Far Western Demonstration, according to the methods previously described, the committee considered many factors. They balanced carefully the needs of the 22 applicants—with the probabilities of the community being able and willing to carry on a permanent program.

The local committee which presented Marion County's claims was made up of representatives of all of the important community interests, official and voluntary, lay and professional.

The demonstration has now been in operation for one and one-half years. Through the active coöperation of the local groups a careful study was made of the health resources, and needs of the county. As a result of this study the first steps of a well-rounded program have been taken through the coördination of services already present and the establishment of certain additional services.

These services include:

Health Department—At the beginning of the demonstration there was a part-time city health officer in Salem, and one

in the county. Each of them lacked both experience and budgets. In addition to these officials were a part-time school physician and a school nurse—all health workers employed by the community.

It has been possible to bring about a coöperation of all these forces, and to establish a county health unit. The local funds were supplemented by funds from the State Board of Health and the Commonwealth Fund. The director of the demonstration is now County Health Officer at a nominal salary, with a full-time deputy who is being trained to take leadership in the public health field when the demonstration terminates.

Medical Service—At the opening of the demonstration no provision had been made for the routine health examinations of infants or school children. This led to the establishment of a medical service, with a full-time, well trained pediatrist in charge. Through this service there is now available for all of the children of the county a system of regular health examinations with the coöperation and participation of the local physicians.

Dental Service—Adequate reparative and preventive dental service is now recognized as an essential of any well-rounded community health program. To make this service available in the smaller places and rural areas, presents many difficulties. In Marion County we are conducting a coöperative dental experiment within the demonstration.

The organized dental profession of Oregon is a progressive group. Its members tax themselves $3.50 apiece annually to create an educational fund. This fund is administered through the State Board of Dental Examiners. This Board was desirous of finding a sound method for developing a state-wide program. In an effort to work out such a program the Board of Dental Examiners and the Commonwealth Fund are jointly financing a dental unit as a part of the Marion County Demonstration. A full-time public health dentist is receiving the active coöperation of the organized dental profession in promoting a preventive and reparative program for the county.

Nursing Service—With the exception of one school nurse, public health nursing was practically non-existent. Because of its fundamental character in a health program, and recognizing it as one of the community's greatest needs, a completely generalized plan of nursing, including bedside care and delivery service, has been established. The county has been divided into eight districts, served by nine nurses under a competent supervisor and directed by a skilled and experienced director of nursing.

Health Education Service—In keeping with the scope of a well-rounded health program, definite provision has been made to provide health education service for both children and adults. In the schools this has been made operative by placing at the disposal of the local school authorities a trained health educator, who has become a part of the teaching staff of the schools. For adults, facilities are being developed by means of extension courses and study groups.

Statistical Service—Since an essential part of the child health program of the Commonwealth Fund consists of a careful evaluation of its work, a statistical service forms one of the important activities of the demonstration. In addition, the research function of this division produces live materials for administrative control and educational purposes. It also has a responsibility in helping to devise permanent records and statistics. These should yield sound, fundamental data and at the same time be practical for a permanent part of the local program.

This concludes a mere enumeration of the various health services which are now available for the children of Marion County. Each one of them is accepted by health workers as an essential part of any modern health program. Of themselves they present nothing new in the public health field, for one may find any one of these services, or a combination of them, being effectively furnished in many

places. It is only when they are considered as a unit, and the method by which we are attempting to integrate them with the community life, that we feel we are treading on new ground.

This new ground lies largely in the field of relationships with official agencies, professional groups and the community. The methods by which we are hoping to reach our objectives depart from the usual models. This can best be illustrated by a necessarily brief discussion of relationships with the various local groups upon whom must rest the responsibility for the continuance of the demonstration program.

RELATIONSHIP OF LOCAL GROUPS

In the case of the Departments of Health and Education this takes on primary importance. We sought a way to make effective our aim to reënforce the work of these officials. It was realized that more was needed than mere routine approval of our plans. This led to the development of a relationship with educational authorities. We have a trained health educator who is a member of the faculty of the city and county school systems. More important than this, both the city and county superintendents of education attend the weekly staff conferences of the demonstration. Here they actively participate in the development of the school health projects and assure the proper correlation of our health projects with their educational plans. Our experience with this plan indicates that it is a valuable method of influencing local practices without usurping local functions. The same general scheme of relationships is being applied satisfactorily in our contact with the health officials. In this the director of the demonstration is acting as intermediary.

The relation of public health activities to the practice of medicine and dentistry always presents a problem. We have secured our present working plan through the organized groups. We were assured before Marion County was selected that the Medical Society was willing to assist in working out the program. This assurance has been made effective through a medical advisory committee appointed from the County Medical Society. It is one of those rare committees that actually functions. With the director and the pediatrist it has worked out a medical policy for the demonstration. Through it our proposed plans are interpreted to the whole profession. From it we receive constructive criticisms of our methods and activities. Through the advice and support of this committee we have been able to establish a relationship with the practicing physician, which is demonstrating to him the sincerity of our objective to promote the legitimate interests of the medical profession; and at the same time we are assisting Marion County in developing an effective community health program.

THE DEMONSTRATION AND COMMUNITY ORGANIZATION

It is in the field of community organization that the demonstration is making its most significant contribution. One of our outstanding needs to-day is some method by which sound, intelligent public opinion can be created on matters relating to health. We believe that this can best be accomplished through a form of local organization, providing for active participation of the local group in program making. This is now being done in Marion County through a series of local councils and a county council. Each local council is made up of a representative from every organized community group. Such a council is formed only when sufficient demand has come from the community for the services of the demonstration.

The tests of the genuineness of this demand is whether a local group is ready to equip, maintain and conduct a local health center as a working headquarters for its health services. At present 11 such centers are in operation in Marion County. The increasing mani-

festations of interest and the feeling of responsibility for local health service adapted to their needs are the most significant results of a demonstration program. Local leaders are being developed in these groups, who will be most effective in building up an intelligent understanding and support for proper health service.

In addition to these local councils a county-wide advisory council has been established. This is made up of a representative from each of the local councils, plus a delegate from all of the county-wide organizations and the city and county officials. This council assists in working out all county-wide projects. It operates through a series of special committees. This group of local leaders is already manifesting a sense of real responsibility for building up an intelligent public opinion for adequate health service.

Through these relationships with the government agencies, professional groups and the community in Marion County, we have translated our objectives and policies into a working organization. We feel that these objectives and policies are legitimate ones for a health demonstration sponsored by outside funds. We are convinced that funds are being expended wisely in an effort to find newer and better methods for promoting public health. The response of the community indicates that our activities are in harmony with desires of local leaders for sound social development. The health demonstration organized and operated in this way would appear to be one of the most valuable devices in the field of public health.

DISCUSSION

Chairman Farrand—There are certain activities in this American life of ours which it is the God-given right of every American citizen to criticise at all times; for example, the educational system, which I find is always under fire. There are constant suggestions for its improvement, usually uninformed except from the inside. There are certain positions connected with these activities which call for equanimity if success is to be achieved.

There is a new officer who has come into the field—a new officer who never can suit and satisfy the population—and that is the director of a modern foundation. And in these demonstrations there is the participation not only of the health officials, not only of the medical profession, not only those of us who are unattached to anything but interested in these enterprises, but there is also that very important and essential provider of funds. We are very fortunate in having with us the experienced and deeply interested director of one of the funds which has given very careful thought and analysis to the wise expenditure of those funds placed at its disposal for the improvement of conditions in this country and in the world. I ask Mr. Barry Smith, Director of The Commonwealth Fund, to give his point of view, which, as I say, is beyond criticism.

Barry C. Smith—I have listened with a great deal of profit to the speakers this evening, but I have a little feeling that we are taking ourselves rather seriously. Mr. Folks has given us some very valuable and sound figures on the financial costs of the demonstrations; and it seems to me if we could relate the idea of public health to that social consciousness which has developed in some other fields much further than it has in public health, the giving of such figures and the discussion of the question of costs would be unnecessary.

I should like to ask you to go back to the time of the Boston Tea Party, and visualize, if you can, the mental attitude of the district schoolma'am of those days, if somebody had suggested to her that our modern public educational system would develop to the point of efficiency and expenditure which it has to-day. When we look at our great public school systems with their tremendous expenditures; when we look also at our great state universities and their enormous endowments and the budgets they demand each year; when we think of the great private institutions in existence, many of them with great endowments; and realize that even then our public is not satisfied and that there exist to-day two great Foundations, the Carnegie Corporation

and the General Education Board of the Rockefeller group, which are giving millions annually to the further development of education, when we realize what the cost of modern education is, and that our public not only accepts it but demands it, then we realize something of the social consciousness of the people of the United States with regard to the education of their children. We also know that if a two by four mayor somewhere tries to cut out, in the interests of economy, some important feature of the public school budget, what is likely to happen to him at the next election.

I know, for instance, one community where the Commonwealth Fund has a health demonstration, which two years ago expended, aside from capital expenditure, twenty-six dollars per capita on its public school system.

Now, why all this debate and argument over the question of whether we shall spend five cents or a dollar or two dollars or three dollars, on public health? Personally (and I can speak at least for the Commonwealth Fund), we are not in the least interested in the subject. The trouble at the present time in the public health movement, as I see it, is that, generally speaking, among our people there is a lack of social consciousness when it comes to the value of public health. In this room and throughout the country we have keen-minded, trained public health officers, who understand what public health in all its variations means to their public, to the public in their particular communities. There is not a public health officer in the United States to-day who does not say to himself in the depths of his own soul, "I wish I could get more money. I wish I could develop my program." They all know they cannot do what they want to do, what they know how to do, what they realize would be of great value, because the social consciousness on health matters in their communities has not been developed to the point where the public appreciates that it gets a return for its money. Public health is purchasable, as the late Hermann M. Biggs said, but the people must be educated to the point where they really realize that it is worth purchasing, just as they have come to realize that education is worth purchasing. In my judgment—and I believe in yours—health is just as important a purchasable article as education.

And so what are these Foundations trying to do? Nothing in the world except this—to put on exhibitions, if you like, demonstrations, of what can be accomplished by a reasonably complete program in any given community, in the hope and belief that if these demonstrations are successful, within a very few years thereafter the social consciousness on the subject of public health will be so aroused in many other communities that have never had a demonstration, that they will be spending two or three times the amount that these demonstrations are spending to-day.

So I do not feel any interest personally in this question of what is the per capita cost. This is the real point: if we can prove through these demonstrations that public health is not only purchasable but worth purchasing, if we can arouse a social consciousness of the people to an appreciation on their part of the value of public health, then the cost will take care of itself. I fully expect to live to see the time when many an American community will be spending ten times per capita what any American community is spending to-day.

Chairman Farrand—Although the retiring president of the American Public Health Association is not a health official he is a very well known and distinguished authority in the field of public health. I call upon Prof. C.-E. A. Winslow of Yale University to give us his ideas on this subject.

C.-E. A. Winslow, Dr.P.H.—You have asked pleadingly for criticism and I would make one very definite criticism. I think you, who are behind these demonstrations, are much too modest. You devoted one meeting, or rather the Trustees of the Milbank Fund devoted a meeting, in New York a year ago, to the attempt to answer the statements that were made in the columns of that eminent periodical, *Life*, to the effect that it was not worth while to live long after all. You stopped to consider whether it was worth while to prolong life. And now you are devoting this meeting to a consideration of the question as to whether a demonstration demonstrates. I think you are too cautious, and as your chairman has said, you ought to mix more boldness with your conservatism. Of course, this thing is sound. It is merely an application on a large and impressive scale of what all educators now recognize as the project method, the only sound method of teaching. That method of demonstration must, I think, as has been implied, be combined with experimentation. I am sure Dr. Farrand did not mean to discourage that. All teaching must be combined with experimentation, all teaching must be combined

with research, if it is to be sound and fruitful.

It seems to me that the second most important accomplishment of the Framingham Demonstration was definitely along the line of research. It was the contribution of the idea of the consultation service in tuberculosis, which was a new thing—an experiment, never tried before, and all through the course of these demonstrations things that are new have been done and must be done.

The first result of the Framingham Demonstration and the most important (I said the consultation service was second), was that it led to the Milbank Demonstrations and the Commonwealth Demonstrations—that is the clearest indication of the value of such demonstrations.

Now at a meeting in New York last spring the question was raised as to whether it would not have been wiser to distribute the funds among the various health officers of the country than to establish demonstrations in selected communities. I do not think that was a sound criticism. It seems to me, that the most valuable aid you can render to the health officers of the country in improving their service is to give them these demonstrations, and if the health officers are alert they will use these results you obtain to increase their own appropriations vastly more effectively than they could use the money you might distribute among them.

I am impressed with the value of this type of work not only in the particular demonstration centers and in the various health departments of this country. I have been impressed, as I listened to the speakers to-night, with the fact that you are making here a very real contribution to a world-wide question. In regard to financial matters we in this country are to-day in the position of a creditor nation. But while we are a creditor nation in this sense I think we ought to remember that in all the things that are really worth while we are still a debtor nation. It is to Palestine and Greece, to England and France and to Italy and Germany that we owe our religion and art and science, that we owe everything upon which our real civilization rests. As a debtor nation it is our task to begin in our national adolescence to make due return by adding to the stock of human experience our contribution which we for the most part have still to pay. During the past quarter of a century we have begun to do that along many lines—in architecture, poetry, the drama, and in many branches of science. America is beginning to make her contribution toward this common stock, and we have just the same obligation in the field of medicine and in the field of social organization. Here, too, we are still overwhelmingly in debt to the England of Chadwick, to the France of Pasteur, to the Germany of Koch, and to the Italy of Grassi—and here again we are just beginning to balance our account. We have made perhaps so far two outstanding contributions—the work of Reed and his associates and that of Gorgas and the National Health Board in the eradication of yellow fever and the development of the profession of the public health nurse. I am inclined to think that in what you have heard to-night, lies the germ of what may be perhaps the third great contribution of America to the cause of public health and the cause of social organization.

Comparing these things in America and abroad—on the one hand the extent to which our governmental agencies fall short of efficiency compared to those of the countries of Western Europe; and on the other hand, the development of coöperative voluntary effort and all that goes with it, such as technic of community organization—I am convinced more and more that here is our real contribution.

In this field of the demonstration we are working out methods by which people can coöperate with their governments. These contributions are not merely temporary alternatives but they represent a tendency in which perhaps we are adding something to the sum of knowledge in regard to social organization. The technic of coöperative effort is being worked out in these demonstrations on a scale that should be of value, not only to us but to the whole world.

THE CONTROL OF COMMUNICABLE DISEASES

REPORT OF THE
COMMITTEE ON STANDARD REGULATIONS FOR
THE CONTROL OF COMMUNICABLE DISEASES
OF THE
AMERICAN PUBLIC HEALTH ASSOCIATION

Supplement to the March, 1927, Issue of the
AMERICAN JOURNAL OF PUBLIC HEALTH
370 Seventh Avenue, New York City

FOREWORD TO THE FIRST REPORT

Report of the American Public Health Association Committee on Standard Regulations, Appointed in October, 1916

In the following report the terms used are first defined. Each disease is briefly described with regard to the infective agent, the source of infection, the mode of transmission, the incubation period, and the period of communicability. Following this are given the methods of control—first, those affecting the individual patient and his immediate environment, and, second, general measures bearing upon the control or prevention of the disease in question.

Inasmuch as the laws under which various boards and departments of health operate require differences in the legal phraseology of rules, regulations, or sections of sanitary codes dealing with the control of communicable diseases, the committee has refrained from preparing formal regulations under each disease. As the report is at present submitted any health officer, board of health, or legislative body having the power to make rules or regulations or pass sections of sanitary codes dealing with the control of communicable diseases can, by reference to the description of the disease and recommendations for methods of control herewith proposed, easily prepare the necessary text upon which the educational and administrative acts of the health officer will be based.

The committee is indebted for expert opinion and critical comment upon its tentative conclusions to Dr. Simon Flexner, Dr. William H. Park, Prof. Theobald Smith, and Dr. Bertram H. Waters, and acknowledgment of their contributions to the report in its present form is herewith gratefully expressed.

Haven Emerson, M.D., *Chairman.*
Robert N. Hoyt
F. M. Meader, M.D.
J. C. Perry, M.D.
C.-E. A. Winslow, Dr. P.H.

FOREWORD TO THE SECOND REPORT

Report of the American Public Health Association Committee on Standard Regulations, Appointed in October, 1925

Standard regulations for the control of communicable diseases were recommended by a committee of the American Public Health Association, in October, 1916. This report was published by the United States Public Health Service in *Public Health Reports* for October 12, 1917. Reprints of this report were the standard guide in communicable disease practice for many years. Our knowledge of the nature of these diseases grew, however, and in 1925 a new committee was appointed by the Association to draft a revised report which would take into account our newer knowledge. This revised report which closely follows the style of the earlier report has been officially approved by the United States Public Health Service, and was published by it in the *Public Health Reports* for December 17, 1926. It is here republished with certain corrections.

This revised report of the Committee for the Control of Communicable Diseases was presented before the Public Health Administration Section at the Fifty-fifth Annual Meeting of the American Public Health Association at Buffalo, N. Y., on October 11, 1926. Publication of the revised report was approved by the Governing Council of the Association on October 14, 1926.

The committee acknowledges gratefully the collaboration of the following sanitarians who generously contributed to the present revised text: Doctors Charles V. Chapin, Edwin O. Jordan, William H. Park, J. F. Anderson, E. C. Levy, E. S. Godfrey, and certain medical officers of the Public Health Service.

Haven Emerson, M.D., *Chairman.*
F. E. Harrington, M. D.
Allan J. McLaughlin, M. D.
M. M. Seymour, M. D.
C.-E. A. Winslow, Dr. P.H.

THE CONTROL OF COMMUNICABLE DISEASES

List of Diseases

Actinomycosis	Mumps
Acute infectious conjunctivitis	Paratyphoid fever
Ancylostomiasis (hookworm)	Plague
Anthrax	Pneumonia (acute lobar)
Chickenpox	Poliomyelitis
Cholera	Rabies
Dengue	Rocky Mountain spotted or tick fever
Diphtheria	Scarlet fever
Dysentery (amoebic)	Septic sore throat
Dysentery (bacillary)	Smallpox
Epidemic (lethargic, encephalitis)	Syphilis
Favus	Tetanus
German measles	Trachoma
Glanders	Trichinosis
Gonorrhea	Tuberculosis (pulmonary)
Influenza	Tuberculosis (other than pulmonary)
Leprosy	Tularæmia
Malaria	Typhoid fever
Malta fever	Typhus fever
Measles	Whooping cough
Meningococcus meningitis	Yellow fever

Definitions of Terms

The committee adopted the following definitions of terms:

1. Carrier. A person who, without symptoms of a communicable disease, harbors and disseminates the specific microörganisms.

2. Cleaning. This term signifies the removal by scrubbing and washing, as with hot water, soap, and washing soda, of organic matter on which and in which bacteria may find favorable conditions for prolonging life and virulence; also the removal by the same means of bacteria adherent to surfaces.

3. Contact. A "contact" is any person or animal known to have been sufficiently near to an infected person or animal to have been presumably exposed to transfer of infectious material directly, or by articles freshly soiled with such material.

4. Delousing. By delousing is meant the process by which a person and his personal apparel are treated so that neither the adults nor the eggs of Pediculus corporis or Pediculus capitis survive.

5. Disinfection. By this is meant the destroying of the vitality of pathogenic microörganisms by chemical or physical means.

When the word *concurrent* is used as qualifying disinfection, it indicates the application of disinfection immediately after the discharge of infectious material from the body of an infected person, or after the soiling of articles with such infectious discharges, all personal contacts with such discharges or articles being prevented prior to their disinfection.

When the word *terminal* is used as qualifying disinfection, it indicates the process of rendering the personal clothing and immediate physical environment of the patient free from the possibility of conveying the infection to others, at the time when the patient is no longer a source of infection.

6. Disinfesting. By disinfesting is meant any process, such as the use of dry or moist heat, gaseous agents, poisoned food, trapping, etc., by which insects and animals known to be capable of conveying or transmitting infection may be destroyed.

7. Education in Personal Cleanliness. This phrase is intended to include all the various means available to impress upon all members of the community, young and old, and especially when communicable disease is prevalent or during epidemics, by spoken and printed word, and by illustration and suggestion, the necessity of:

(1) Keeping the body clean by sufficiently frequent soap and water baths.

(2) Washing hands in soap and water after voiding bowels or bladder and always before eating.

(3) Keeping hands and unclean articles, or articles which have been used for toilet purposes by others, away from mouth, nose, eyes, ears, and vagina.

(4) Avoiding the use of common or unclean eating, drinking, or toilet articles of any kind, such as towels, handkerchiefs, hair brushes, drinking cups, pipes, etc.

(5) Avoiding close exposure of persons to sprays from the nose and mouth, as in coughing, sneezing, laughing, or talking.

8. Fumigation. By fumigation is meant a process by which the destruction of insects, as mosquitoes and body lice, and animals, as rats, is accomplished by the employment of gaseous agents.

9. Isolation.[1] By isolation is meant the separating of persons suffering from a communicable disease, or carriers of the infecting organism, from other persons, in such places and under such conditions as will prevent the direct or indirect

[1] In view of the various ambiguous and inaccurate uses to which the words isolation and quarantine are not infrequently put, it has seemed best to adopt arbitrarily the word isolation as describing the limitation put upon the movements of the known sick or "carrier" individual or animal, and the word quarantine as describing the limitations put upon exposed or "contact" individuals.

conveyance of the infectious agent to susceptible persons.

10. QUARANTINE.[1] By quarantine is meant the limitation of freedom of movement of persons or animals who have been exposed to communicable disease for a period of time equal to the longest usual incubation period of the disease to which they have been exposed.

11. RENOVATION. By renovation is meant, in addition to cleansing, such treatment of the walls, floors, and ceilings of rooms or houses as may be necessary to place the premises in a satisfactory sanitary condition.

12. REPORT OF A DISEASE. By report of a disease is meant the notification to the health authorities, and, in the case of communicable disease in animals, also to the respective departments of agriculture which have immediate jurisdiction, that a case of communicable disease exists in a specified person or animal at a given address.

13. SUSCEPTIBLES. A susceptible is a person or animal who is not known to have become immune to the particular communicable disease in question by natural or artificial process.

The items considered necessary for presentation by the committee with regard to each disease are the following:

1. Infectious agent.
2. Source of infection.
3. Mode of transmission.
4. Incubation period.
5. Period of communicability.
6. Methods of control.

(A) The infected individual and his environment—
1. Recognition of the disease.
2. Isolation.
3. Immunization.
4. Quarantine.
5. Concurrent disinfection.
6. Terminal disinfection.

(B) General measures.
(C) Epidemic measures (occasionally require separate mention).

IMPORTANT MEASURES IN BOLDFACE TYPE

Certain measures in the control of some diseases are of particular importance, on account either of their efficiency in preventing the disease or of the danger if they are neglected, and also on account of their proven practicability. They are emphasized in the text by being printed in **boldface type.**

[1] In view of the various ambiguous and inaccurate uses to which the words isolation and quarantine are not infrequently put, it has seemed best to adopt arbitrarily the word isolation as describing the limitation put upon the movements of the known sick or "carrier" individual or animal, and the word quarantine as describing the limitations put upon exposed or "contact" individuals.

ACTINOMYCOSIS

1. INFECTIOUS AGENT. *Actinomyces bovis.*

2. SOURCE OF INFECTION. The nasal and bowel discharges, and the infected material from lesions in human and animal cases of the disease. Uncooked meat from infected animals may serve as a source of infection.

3. MODE OF TRANSMISSION. By contact with the discharges or with articles freshly soiled with the discharges from animal or human cases.

4. INCUBATION PERIOD. Unknown.

5. PERIOD OF COMMUNICABILITY. As long as open lesions remain, as proved by the presence of the infectious agent on microscopic or cultural tests.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—
1. *Recognition of the disease*—Clinical symptoms, confirmed by microscopic examination of discharges from the lesions.
2. *Isolation*—None, provided the patient is under adequate medical supervision.
3. *Immunization*—None.
4. *Quarantine*—None.
5. *Concurrent disinfection*—Of discharges from lesions and articles soiled therewith.
6. *Terminal disinfection*—By thorough cleaning.

(B) General measures—
1. Inspection of meat, with condemnation of carcasses, or infected parts of carcasses, of infected animals.
2. Destruction of known animal sources of infection.

ACUTE INFECTIOUS CONJUNCTIVITIS
(Not Including Trachoma)

(This title to replace the terms gonorrheal ophthalmia, ophthalmia neonatorum, and babies' sore eyes.)

1. INFECTIOUS AGENT. The gonococcus or some member of a group of pyogenic organisms, including the hemoglobinophilic bacilli.

2. SOURCE OF INFECTION. Discharges from conjunctivæ, or adnexa, or genital mucous membranes of infected persons.

3. MODE OF TRANSMISSION. Contact with an infected person or with articles freshly soiled with discharges of such person.

4. INCUBATION PERIOD. Irregular, but usually thirty-six to forty-eight hours.

5. PERIOD OF COMMUNICABILITY. During the course of the disease and until the discharges from the infected mucous membranes have ceased.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the diseases*—Clinical symptoms, confirmed where possible by bacteriological examination.
2. *Isolation*—None, provided the patient is under adequate medical supervision.
3. *Immunization*—None.
4. *Quarantine*—None.
5. *Concurrent disinfection*—Disinfection of conjunctival discharges and articles soiled therewith.
6. *Terminal disinfection* — Thorough cleansing.

(B) General measures—

1. Enforcement of regulations forbidding the use of common towels and toilet articles. Education as to personal cleanliness.
2. Use of silver nitrate or some similar solution in the eyes of the new born.
3. Carrying out of the measures indicated in methods of control for gonorrhea.

ANCYLOSTOMIASIS

(Hookworm)

1. INFECTIOUS AGENT. Ancylostoma (*Necator americanus*).

2. SOURCE OF INFECTION. Feces of infected persons. Infection generally takes place through the skin, occasionally by the mouth.

3. MODE OF TRANSMISSION. The larval forms pierce the skin, usually of the foot, and passing through the lymphatics to the vena cava and the right heart, thence in the blood stream to the lungs, they pierce the capillary walls and pass into the alveoli. Then they pass up the bronchi and trachea to the throat, whence they are swallowed and finally lodge in the small intestine. Also by drinking water containing larvæ, by eating soiled food, by hand to mouth transmission of the eggs or larvæ from objects soiled with infected discharges. The chief reservoir of infectious materials is *contaminated soil*.

4. INCUBATION PERIOD. Seven to ten weeks.

5. PERIOD OF COMMUNICABILITY. As long as the parasite or its ova are found in the bowel discharges of an infected individual. Contaminated soil remains infective for five months in the absence of freezing.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Microscopic examination of bowel discharges.
2. *Isolation*—None.
3. *Immunization*—None.
4. *Quarantine*—None.
5. *Concurrent disinfection* — Sanitary disposal of bowel discharges to prevent contamination of soil and water.
6. *Terminal disinfection*—None.
7. *Treatment*—Appropriate treatment of infected individual to rid the intestinal canal of the parasite and its ova.

(B) General measures—

1. Education as to dangers of soil pollution.
2. Prevention of soil pollution by installation of sanitary disposal systems for human discharges.
3. Personal prophylaxis by cleanliness and the wearing of shoes.

ANTHRAX

1. INFECTIOUS AGENT. Anthrax bacillus, *Bacillus anthracis*.

2. SOURCE OF INFECTION. Hair, hides, flesh, and feces of infected animals.

3. MODE OF TRANSMISSION. Inoculation as by accidental wound or scratch, inhalation of spores of the infectious agent, and ingestion of insufficiently cooked infected meat.

4. INCUBATION PERIOD. Within seven days.

5. PERIOD OF COMMUNICABILITY. During the febrile stage of the disease and until lesions have ceased discharging. Infected hair and hides of infected animals may communicate the disease for many months after slaughter of the animal, and after curing of hide, fur, or hair, unless disinfected.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by bacteriological examination.
2. *Isolation* of the infected individual until the lesions have healed.
3. *Immunization*—None.
4. *Quarantine*—None.
5. *Concurrent disinfection* of the discharges from lesions and articles soiled therewith.
6. *Terminal disinfection* — Thorough cleaning.

(B) General measures—

1. Animals ill with a disease presumably anthrax should be placed immediately in the care of a veterinary surgeon. Proved animal cases of the disease should be killed promptly and the carcasses destroyed, preferably by fire.
2. Isolation of all animals affected with the disease.
3. Immunization of exposed animals under direction of Federal or State Department of Agriculture.
4. Post-mortem examination should be made only by a veterinary surgeon, or in the presence of one.
5. Milk from an infected animal should not be used during the febrile period.
6. Control and disinfection of effluents and trade wastes and of areas of land polluted by such effluents and wastes from factories or premises, where spore-infected hides or other infected hide and hair products are known to have been worked up into manufactured articles.

7. A physician should be constantly employed by every company handling rawhides, or such companies should operate under the direct supervision of a medical representative of the health department.

8. Every employee handling rawhides, hair, or bristles who has an abrasion of the skin should immediately report to a physician.

9. Special instruction should be given to all employees handling rawhides in regard to the necessity of personal cleanliness.

10. Tanneries and woolen mills should be provided with proper ventilating apparatus so that dust can be promptly removed.

11. Disinfection of hair, wool, and bristles of animals originating in known infected centers before they are used or assorted.

12. The sale of hides from an animal infected with anthrax should be prohibited. A violation of this regulation should be immediately reported to the State commissioner of agriculture, by telegram, stating the time, place, and purchaser to whom the hide was sold. The report should also be sent to the person purchasing the hide. Carcasses should be disposed of under the supervision of the State Department of Agriculture. The inspection and disinfection of imported hides are under the supervision of the United States Bureau of Animal Industry. In the event that infection is introduced the State agricultural authorities have jurisdiction over infected animals and the local or State health authorities have jurisdiction over infected persons.

CHICKEN POX

1. INFECTIOUS AGENT. Unknown.

2. SOURCE OF INFECTION. The infectious agent is presumably present in the lesions of the skin and of the mucous membranes; the latter appearing early and rupturing as soon as they appear, render the disease communicable early, that is, before the exanthem is in evidence.

3. MODE OF TRANSMISSION. Directly from person to person; indirectly through articles freshly soiled by discharges from an infected individual.

4. INCUBATION PERIOD. Two to three weeks.

5. PERIOD OF COMMUNICABILITY. Until the primary scabs have disappeared from the mucous membranes and the skin.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms. The chief public health importance of this disease is that cases thought to be chicken pox in persons over 15 years of age, or at any age during an epidemic of smallpox, are to be investigated to eliminate the possibility of their being smallpox.

2. *Isolation*—Exclusion of patient from school, and prevention of contact with non-immune persons.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection* of articles soiled by discharges from lesions.

6. *Terminal disinfection* — Thorough cleaning.

(B) General measures—None.

CHOLERA

1. INFECTIOUS AGENT. Cholera vibrio. *Vibrio comma.*

2. SOURCE OF INFECTION. Bowel discharges and vomitus of infected persons, and feces of convalescent or healthy carriers. Ten per cent of contacts may be found to be carriers.

3. MODE OF TRANSMISSION. By food and water polluted by infectious agent; by contact with infected persons, carriers, or articles freshly soiled by their discharges; by flies.

4. INCUBATION PERIOD. One to five, usually three days, occasionally longer if the healthy carrier stage before development of symptoms, is included.

5. PERIOD OF COMMUNICABILITY. Usually seven to fourteen days or longer and until the infectious organism is absent from the bowel discharges.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by bacteriological examination.

2. *Isolation* of patient in hospital or screened room.

3. *Immunization* by vaccination may be of value.

4. *Quarantine*—Contacts for five days from last exposure, or longer if stools are found to contain the cholera vibrio.

5. *Concurrent disinfection*—Prompt and thorough disinfection of the stools and vomited matter. Articles used by and in connection with the patient must be disinfected before removal from the room. Food left by the patient should be burned.

6. *Terminal disinfection* — Bodies of those dying from cholera should be cremated if practicable, or, otherwise, wrapped in a sheet wet with disinfectant solution and placed in water-tight caskets. The room in which a sick patient was isolated should be thoroughly cleaned and disinfected.

(B) General measures—

1. Rigid personal prophylaxis of attend-

ants by scrupulous cleanliness, disinfection of hands each time after handling patient or touching articles contaminated by dejecta, the avoidance of eating or drinking anything in the room of the patient, and the prohibition of those attendant on the sick from entering the kitchen.

2. The bacteriological examination of the stools of all contacts to determine carriers. Isolation of carriers.

3. Water should be boiled, if used for drinking or toilet purposes, or if used in washing dishes or food containers, unless the water supply is adequately protected against contamination or is so treated, as by chlorination, that the cholera vibrio can not survive in it.

4. Careful supervision of food and drink. Where cholera is prevalent, only cooked foods should be used. Food and drink after cooking or boiling should be protected against contamination, as by flies and human handling.

(C) Epidemic measures—

Inspection service for early detection and isolation of cases; examination of persons exposed in infected centers for detection of carriers, with isolation or control of carriers; disinfection of rooms occupied by the sick, and the detention, in suitable camps for five days, of those desirous of leaving for another locality. Those so detained should be examined for detection of carriers.

DENGUE

1. INFECTIOUS AGENT. Unknown.

2. SOURCE OF INFECTION. The blood of infected persons.

3. MODE OF TRANSMISSION. By the bite of infected mosquitoes, *Aedes aegypti*.

4. INCUBATION PERIOD. Three to ten days.

5. PERIOD OF COMMUNICABILITY. From the day before onset to the fifth day of the disease.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms.

2. *Isolation*—The patient must be kept in a screened room.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection*—None.

6. *Terminal disinfection*—None. Upon termination of the case, fumigation of the room and house, to destroy mosquitoes.

(B) General measures—

Measures directed toward elimination of mosquitoes (Aedes ægypti). Screening of rooms.

DIPHTHERIA

1. INFECTIOUS AGENT. Diphtheria bacillus, *Corynebacterium diphtheriae*, the Klebs-Loeffler bacillus.

2. SOURCE OF INFECTION. Discharges from diphtheretic lesions of nose, throat, conjunctiva, vagina, and wound surfaces. Secretions from the nose and throat of carriers of the bacillus.

3. MODE OF TRANSMISSION. Directly by personal contact, indirectly by articles freshly soiled with discharges, or through infected milk or milk products.

4. INCUBATION PERIOD. Usually two to five days, occasionally longer if a healthy carrier stage precedes the development of clinical symptoms.

5. PERIOD OF COMMUNICABILITY. Until virulent bacilli have disappeared from the secretions and the lesions. The persistence of the bacilli after the lesions have healed is variable. In fully three-fourths of the cases they disappear within two weeks. In 95 per cent of cases, the bacilli disappear in four weeks. In exceptional cases virulent bacilli remain in the throat and discharges for from two to six months.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—By clinical symptoms with confirmation by bacteriological examination of discharges.

2. Isolation—Until two cultures from the throat and two from the nose, taken not less than twenty-four hours apart, fail to show the presence of diphtheria bacilli. Isolation may be terminated if persistent diphtheria bacilli prove avirulent. Where termination by culture is impracticable, cases may be terminated with fair safety as a rule sixteen days after onset of the disease.

3. *Immunization*—Exposed susceptibles who cannot be kept under daily observation by a physician or nurse should be promptly immunized by antitoxin. (By susceptibles is meant such individuals as are found to be nonimmune by the Schick test, i. e., those who give a positive reaction.)

4. *Quarantine*—All exposed persons until shown by bacteriological examination not to be carriers.

5. *Concurrent disinfection* of all articles which have been in contact with the patient and all articles soiled by discharges from the patient.

6. *Terminal disinfection*—At the end of the illness, thorough airing and sunning of the sick room, with cleaning or renovation.

(B) General measures—

1. Pasteurization of milk supply.

2. Application of the Schick test to all especially exposed persons, such as nurses and physicians, and active immunization of all susceptibles, but not within three weeks after the administration of antitoxin.

3. Active immunization of all children by the end of the first year without

prior Schick testing; active immunization of school children with or without prior use of the Schick test.

4. Determination of presence or absence of carriers among contacts and, so far as practicable, in the community at large.

DYSENTERY (AMŒBIC)

1. INFECTIOUS AGENT. *Endamœba histolytica.*

2. SOURCE OF INFECTION. The bowel discharges of infected persons.

3. MODE OF TRANSMISSION. By drinking contaminated water, and by eating infected foods, and by hand-to-mouth transfer of infected material; from objects soiled with discharges of an infected individual, or of a carrier; by flies.

4. INCUBATION PERIOD. Unknown.

5. PERIOD OF COMMUNICABILITY. During course of disease and until repeated microscopic examination of stools shows asence of Amœba histolytica.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by microscopic examination of stools.

2. *Isolation*—None.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection* of the bowel discharges.

6. *Terminal disinfection*—Cleaning.

(B) General measures—

1. Boil drinking water unless the supply is known to be free from contamination.

2. Water supply should be protected against contamination, and supervision should be exercised over all foods eaten raw.

DYSENTERY (BACILLARY)

1. INFECTIOUS AGENT. Dysentery bacillus, *Erberthella dysenteriae, Erberthella para dysenteriae.*

2. SOURCE OF INFECTION. The bowel discharges of infected persons.

3. MODE OF TRANSMISSION. By drinking contaminated water, by eating infected foods, and by hand-to-mouth transfer of infected material; from objects soiled with discharges of an infected individual or of a carrier; by flies.

4. INCUBATION PERIOD—Two to seven days.

5. PERIOD OF COMMUNICABILITY. During the febrile period of the disease and until the organism is absent from the bowel discharges.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by serological and bacteriological tests.

2. *Isolation*—Infected individuals during the communicable period of the disease.

3. *Immunization*—Vaccines give considerable immunity. Owing to severe reactions their use is not universal, nor should it be made compulsory except under extreme emergency.

4. *Quarantine*—None.

5. *Concurrent disinfection*—Bowel discharges.

6. *Terminal disinfection*—Cleaning.

(B) General measures—

1. Rigid personal prophylaxis of attendants upon infected persons.

2. No milk or food for human consumption should be sold from a place occupied by a patient unless the persons engaged therein occupy quarters separate from the house where the patient is sick, and all utensils used are cleaned and kept in a separate building and under a permit from the health officer.

3. All attendants upon persons affected with this disease should be prohibited from having anything to do with the handling of food.

4. Necessary precautions against flies.

5. Careful supervision of food and drink. Where dysentery is prevalent, only cooked foods should be used. Food and drink after cooking or boiling should be protected against contamination, as by flies and human handling.

EPIDEMIC (LETHARGIC) ENCEPHALITIS

1. INFECTIOUS AGENT. Unknown.

2. SOURCE OF INFECTION. Probably discharges from the nose and throat of infected persons, or articles freshly soiled therewith. It is supposed that there are healthy carriers during prevalence of the disease.

3. MODE OF TRANSMISSION. Probably by direct contact with an infected person or a carrier of the virus, or by contact with articles freshly soiled with the discharges of the nose or throat of such persons.

4. INCUBATION PERIOD. Undetermined. Believed to be about ten days.

5. PERIOD OF COMMUNICABILITY. Probably during the febrile stage of the disease.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*, by clinical symptoms.

2. *Isolation* of recognized cases for one week after onset.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection*—Discharges of the nose and throat and articles soiled therewith.

6. *Terminal disinfection*—Cleaning.

(B) General measures—

1. Search for and examination of cases during periods of prevalence.

2. Isolation of suspected febrile cases pending diagnosis.

FAVUS

1. INFECTIOUS AGENT. *Achorion schoenleinii.*

2. SOURCE OF INFECTION. Lesions of skin, particularly on scalp.

3. MODE OF TRANSMISSION. Direct contact with patient, and indirectly through toilet articles.

4. INCUBATION PERIOD. Unknown.

5. PERIOD OF COMMUNICABILITY. Until skin and scalp lesions are all healed.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms confirmed by microscopic examination of crusts.

2. *Isolation*—Exclusion of patient from school and other public places until lesions are healed.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection*—Toilet articles of patient.

6. *Terminal disinfection*—None.

(B) General measures—

1. Elimination of common utensils, such as hair brushes and combs.

2. Provision for adequate and intensive treatment and cure of cases of favus at hospitals and dispensaries, to abbreviate the period of infectivity of the patients.

GERMAN MEASLES (RUBELLA)

1. INFECTIOUS AGENT. Unknown.

2. SOURCE OF INFECTION. Secretions of the mouth and possibly of the nose.

3. MODE OF TRANSMISSION. By direct contact with the patient or with articles freshly soiled with the discharges from the nose or throat of the patient.

4. INCUBATION PERIOD. From fourteen to twenty-one days.

5. PERIOD OF COMMUNICABILITY. Eight days from onset of the disease.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms.

2. *Isolation*—Separation of the patient from nonimmune children, and exclusion of the patient from school and public places for the period of presumed infectivity.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection*—Discharges from the nose and throat of the patient and articles soiled by discharges.

6. *Terminal disinfection*—Airing and cleaning.

(B) General measures—None.

NOTE—The reason for attempting to control this disease is that it may be confused with scarlet fever during its early stages; each person having symptoms of the disease should therefore be placed under the care of a physician and the case should be reported to the local department of health.

GLANDERS

1. INFECTIOUS AGENT.—Glanders bacillus, *Pfefferella mallei.*

2. SOURCE OF INFECTION. Discharges from open lesions of mucous membranes, or of the skin of human or equine cases of the disease (i. e., pus and mucus from the nose, throat, and bowel discharges from infected man and horse).

3. MODE OF TRANSMISSION. Contact with a case or with articles freshly soiled by discharges from a human or equine case.

4. INCUBATION PERIOD. Unknown.

5. PERIOD OF COMMUNICABILITY. Until bacilli disappear from discharges or until lesions have healed.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—By specific biological reactions, such as the complement fixation test, the mallein test, the agglutination test, or by nonspecific reactions, such as the Straus reaction, if confirmed by culture, or by identification of the *Bacillus mallei*, or by autopsy of doubtful cases.

2. *Isolation*—Human case at home or hospital; for infected horses destruction rather than isolation is advised. **Skin contact with the lesions in the living or dead body is to be scrupulously avoided.**

3. *Immunization*—None of established value or generally accepted.

4. *Quarantine* of all horses in an infected stable until all have been tested by specific reaction, and the removal of infected horses and terminal disinfection of stable have been accomplished.

5. *Concurrent disinfection*—Discharges from human cases and articles soiled therewith.

6. *Terminal disinfection*—Stables and contents where infected horses are found.

(B) General measures—

1. The abolition of the common drinking trough for horses.

2. Sanitary supervision of stables and blacksmith shops.

3. Semi-annual testing of all horses by a specific reaction where the disease is common.

4. Testing of all horses offered for sale where the disease is common.

NOTE—In this disease, as in all infectious or communicable diseases from which both animals and humans suffer, cases occurring in animals should be reported to the Department of Agriculture and human cases should be reported to the Department of Health, reciprocal notification thereafter to be accomplished through official interdepartment channels.

GONORRHEA

1. INFECTIOUS AGENT. Gonococcus, *Neisseria gonorrhoeae.*

2. SOURCE OF INFECTION. Discharges from lesions of inflamed mucous membranes and glands of infected persons, viz., urethral, vaginal, cervical, conjunctival mucous membranes, and Bartholin's or Skene's glands in the female, and Cowper's and the prostate glands in the male.

3. MODE OF TRANSMISSION. By direct personal contact with infected persons, and indirectly by contact with articles freshly soiled with the discharges of such persons.

4. INCUBATION PERIOD. One to eight days, usually three to five days.

5. PERIOD OF COMMUNICABILITY. As long as the gonococcus persists in any of the discharges, whether the infection be an old or a recent one.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by bacteriological examination or serum reaction.

2. *Isolation*—When the lesions are in the genito-urinary tract, exclusion from sexual contact, and when the lesions are conjunctival, exclusion from school or contact with children, as long as the discharges contain the infecting organism.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection*—Discharges from lesions and articles soiled therewith.

6. *Terminal disinfection*—None.

(B) General measures—

1. Education in matters of sexual hygiene, particularly as to the fact that continence in both sexes at all ages is compatible with health and normal development.

2. Provision for accurate and early diagnosis, and treatment in hospitals and dispensaries of infected persons, with consideration for privacy of record and provision for following cases until cured.

3. Repression of prostitution by use of police power and control of use of living premises.

4. Restriction of sale of alcoholic beverages.

5. Restrictions of advertising of services or medicines for the treatment of sex diseases, etc.

6. Elimination of common towels and toilet articles from public places.

7. Use of prophylactic silver solution in the eyes of the new born.

8. Exclusion of persons in the communicable stage of the disease from participation in the preparing and serving of food.

9. Personal prophylaxis should be advised to those who expose themselves to opportunity for infection.

INFLUENZA

1. INFECTIOUS AGENT. Undetermined.

2. SOURCE OF INFECTION. Probably discharges from the mouth and nose of infected persons and articles freshly soiled with such discharges.

3. MODE OF TRANSMISSION. Believed to be by direct contact, by droplet infection or by articles freshly soiled with discharges of the nose and throat of infected persons.

4. INCUBATION PERIOD. Short, usually twenty-four to seventy-two hours.

5. PERIOD OF COMMUNICABILITY. Undetermined, apparently during the febrile period or at least for seven days from onset of clinical symptoms.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—By clinical symptoms only. Uncertain in interepidemic periods.

2. *Isolation*—During acute stage of disease.

3. *Immunization*—None; vaccines have not proved of definite value.

4. *Quarantine*—None.

5. *Concurrent disinfection*—Discharges from the nose and throat of the patient.

6. *Terminal disinfection*—Airing and cleaning.

(B) General measures—

During epidemics efforts should be made to reduce opportunities for direct-contact infection, as in crowded halls, stores, and street cars. Kissing, the use of common towels, glasses, eating utensils, or toilet articles should be avoided. The hands should be washed carefully before eating. In isolated towns and institutions, infection has been delayed and sometimes avoided by strict exclusion of visitors from already infected communities. The closing of schools has not been effective in checking the spread of infection. The use of masks by nurses and other attendants has proved of value in preventing infection in hospitals. Scrupulous cleanliness of dishes and utensils used in preparing and serving food in public eating places should be required, including the subjection of all such articles to disinfection in hot soapsuds. In groups which can be brought under daily professional inspection, the isolation of early and suspicious cases of respiratory tract inflammation, particularly when ac-

companied with a rise in temperature, may be relied upon to delay the spread of the disease. To minimize the severity of the disease and to reduce mortality, patients should go to bed at the beginning of an attack and not return to work without the approval of their physician.

LEPROSY

1. INFECTIOUS AGENT. Leprosy bacillus, *Mycobacterium leprae*.

2. SOURCE OF INFECTION. Discharges from lesions.

3. MODE OF TRANSMISSION. By close, intimate, and prolonged contact with infected individuals. Flies and other insects may be mechanical carriers.

4. INCUBATION PERIOD. Prolonged, undetermined.

5. PERIOD OF COMMUNICABILITY. Infectivity exists throughout the duration of the disease. Where good standards of personal hygiene prevail, this disease is but slightly communicable.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by bacteriological examination.

2. *Isolation* for life in national leprosarium when this is possible, or at least until treatment has brought about a healing of all lesions of skin and mucous membranes and the patient has been observed with the disease in this arrested form for not less than six months.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection*—Discharges and articles soiled with discharges.

6. *Terminal disinfection* — Thorough cleansing of living premises of the patient.

(B) General measures—

1. Lack of information as to the determining factors in the spread and communication of the disease makes any but general advice in matters of personal hygiene of no value.

2. As a temporary expedient lepers may be properly cared for in local hospitals, or if conditions of the patient and his environment warrant, he may be allowed to remain on his own premises under suitable regulations.

MALARIA

1. INFECTIOUS AGENT. The several species of malarial organisms—*Plasmodium vivax* (tertian); *Plasmodium malariae* (quartan); *Laveranía falciparum* (æstivo-autumnal).

2. SOURCE OF INFECTION. The blood of an infected individual.

3. MODE OF TRANSMISSION. By bite of the infected Anopheles mosquitoes. The mosquito is infected by biting an individual suffering from acute or chronic malaria. The parasite develops in the body of the mosquito for from ten to fourteen days, after which time the sporozoites appear in its salivary glands.

4. INCUBATION PERIOD. Varies with the type of species of infecting organism and the amount of infection; usually fourteen days in the tertian variety.

5. PERIOD OF COMMUNICABILITY. As long as the malaria organism exists in the blood.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, always to be confirmed by microscopical examination of the blood. Repeated examinations may be necessary.

2. *Isolation*—None except protection of the patient from approach of mosquitoes by screening his bed or room or house, until his blood is rendered free from malarial parasites by thorough treatment with quinine.

3. *Immunization*—None. The administration of prophylactic doses of quinine should be insisted upon for those constantly exposed to infection and unable to protect themselves against Anopheles mosquitoes.

4. *Quarantine*—None.

5. *Concurrent disinfection*—None. Destruction of Anopheles mosquitoes in the sick room.

6. *Terminal disinfection*—None. Destruction of Anopheles mosquitoes in the sick room.

(B) General measures—

1. Employment of known measures for destroying larvæ of anophelines and the eradication of breeding places of such mosquitoes.

2. Blood examination of persons living in infected centers to determine the incidence of infection.

3. Screening sleeping and living quarters; use of mosquito nets.

4. Killing mosquitoes in living quarters.

MALTA FEVER

1. INFECTIOUS AGENT. *Micrococcus melitensis; Brucella melitensis; Alkaligenes melitensis; Alkaligenes abortus.*

2. SOURCE OF INFECTION. The milk and urine of infected goats, and the urine, blood, and milk of other infected domestic animals, mules, asses, horses, cows, oxen, hogs, sheep, rabbits, dogs, and fowls; the urine of infected persons and of carriers of the organism.

3. MODE OF TRANSMISSION. By ingestion of milk from infected goats commonly; by direct contact with infected animals and persons and their urinary discharges in ways to permit the contamination of food and hands, occasionally; by inhalation of dust from soil or

surfaces contaminated with urinary discharges of infected animals or persons rarely; possibly by inoculation through abrasions of the skin by contaminated dust or soil, and by sexual intercourse with infected persons, and rarely by ingestion of infected cow's milk or by contact with infected blood or organs of domestic animals.

4. INCUBATION PERIOD. Six to sixteen days.

5. PERIOD OF COMMUNICABILITY. From the onset of the disease until the organism is no longer found in the urine, usually ninety days, with a range of twenty to three hundred days.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease* — The clinical picture and particularly the undulant character of the fever, supplemented by exact determination through the use of agglutination tests and bacteriological examination of the blood and urine for the infecting organism.

2. *Isolation* of infected individuals during the period of communicability.

3. *Immunization*—Preventive vaccination by suspensions of mixtures of the *Micrococcus melitensis* and *Micrococcus paramelitensis* have given good results. This is advised for exposed susceptibles, especially those handling goats in areas where the disease is known to exist. Autogenous vaccines have been used with but little success in the treatment of the disease.

4. *Quarantine*—None.

5. *Concurrent disinfection* of all discharges, especially the urine and of articles soiled with such discharges.

6. *Terminal disinfection*—Cleaning.

(B) General measures—

1. Sterilization of goats' milk.
2. Protection of public water supplies.
3. Supervision of human carriers and their exclusion from the handling of foods.
4. Destruction of infected animals.
5. Search for infection among goats by the serum and the lacto reaction (Zammit).
6. Immunization of goats by vaccines in areas where the disease is prevalent.
7. Exclusion of goats from areas of infection.
8. Sanitary supervision of goat shelters.

MEASLES

1. INFECTIOUS AGENT. Unknown.

2. SOURCE OF INFECTION. Buccal and nasal secretions of an infected individual.

3. MODE OF TRANSMISSION. Directly from person to person; indirectly through articles freshly soiled with the buccal and nasal discharges of an infected individual. The most easily transmitted of all communicable diseases.

4. INCUBATION PERIOD. About ten days.

5. PERIOD OF COMMUNICABILITY. During the period of catarrhal symptoms and until the cessation of abnormal mucous membrane secretions—minimum period of nine days; from four days before to five days after the appearance of the rash.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms. Special attention to rise of temperature, Koplik spots and catarrhal symptoms in exposed individuals.

2. *Isolation*—During period of communicability.

3. *Immunization*—By the use of the serum or whole blood of convalescent measles patients, or of any healthy adults who have had measles, given within five days after exposure to a known case of measles, the attack in the exposed person may be averted in a high percentage of instances; if not averted, the disease is modified. Given later, but at a time prior to the clinical onset of the disease, convalescent serum usually modifies the severity of the attack and the patient acquires the usual lasting immunity of the disease.

4. *Quarantine*—Exclusion of exposed susceptible school children and teachers from school until fourteen days from last exposure. This applies to exposure in the household. Exclusion of exposed susceptible children from all public gatherings for the same period.

5. *Concurrent disinfection*—All articles soiled with the secretions of the nose and throat.

6. *Terminal disinfection* — Thorough cleaning.

(B) General measures—

1. Daily examination of exposed children and of other possibly exposed persons. This examination should include record of the body temperature. A non-immune exposed individual exhibiting a rise of temperature of 0.5° C. or more should be promptly isolated pending diagnosis.

2. Schools should not be closed or classes discontinued where daily observation of the children by a physician or nurse is provided for.

3. Education as to special danger of exposing young children to those exhibiting acute catarrhal symptoms of any kind.

4. In institutional outbreaks immunization with convalescent serum of all minor inmates who have not had measles is of value in checking the spread of infection and in reducing mortality.

MENINGOCOCCUS MENINGITIS

1. INFECTIOUS AGENT. Meningococcus; *Neisseria intracellularis.*

2. SOURCE OF INFECTION. Discharges from the nose and mouth of infected persons. Clinically recovered cases, and healthy persons who have never had the disease but have been in contact with cases of the disease or other carriers, act as carriers and are commonly found, especially during epidemics. Such healthy carriers are not uncommonly found independent of epidemic prevalence of the disease.

3. MODE OF TRANSMISSION. By direct contact with infected persons and carriers, and indirectly by contact with articles freshly soiled with the nasal and mouth discharges of such persons.

4. INCUBATION PERIOD. Two to ten days, commonly seven. Occasionally for longer periods when a person is a carrier for a time before developing the disease.

5. PERIOD OF COMMUNICABILITY. During the clinical course of the disease and until the specific organism is no longer present in the nasal and mouth discharges of the patient. The same applies to healthy carriers so far as affects persistence of infectious discharges.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by the microscopic and bacteriological examination of the spinal fluid, and by bacteriological examination of nasal and pharyngeal secretions.

2. *Isolation* of infected persons until fourteen days after onset of the disease.

3. *Immunization* by the use of vaccines is still in the experimental stage.

4. *Quarantine*—None.

5. *Concurrent disinfection* of discharges from the nose and mouth and of articles soiled therewith.

6. *Terminal disinfection*—Cleaning.

(B) General measures—

1. Search for carriers among families and associates of recognized cases by bacteriological examination of posterior nares of all contacts.

2. Education as to personal cleanliness and necessity of avoiding contact and droplet infection.

3. Prevention of overcrowding such as is common in living quarters, transportation conveyances, working places, and places of public assembly in the civilian population, and in inadequately ventilated closed quarters in barracks, camps, and ships among military units.

(C) Epidemic measures—

1. Increase the separation of individuals and the ventilation in living and sleeping quarters for such groups of people as are especially exposed to infection because of their occupation or some necessity of living conditions. Bodily fatigue and strain should be minimized for those especially exposed to infection.

2. Carriers should be quarantined until the nasal and pharyngeal secretions are proved by bacteriological examination to be free from the infecting organism.

MUMPS

1. INFECTIOUS AGENT. Unknown.

2. SOURCE OF INFECTION. Secretions of the mouth and possibly of the nose.

3. MODE OF TRANSMISSION. By direct contact with an infected person or with articles freshly soiled with the discharges from the nose or throat of such infected person.

4. INCUBATION PERIOD. From twelve to twenty-six days. The most common period, eighteen days, accepted as usual. A period of twenty-one days is not uncommon.

5. PERIOD OF COMMUNICABILITY. Unknown, but assumed to persist until the parotid gland has returned to its normal size.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Inflammation of Stenson's duct may be of assistance in recognizing the early stage of the disease. The diagnosis is usually made on swelling of the parotid gland.

2. *Isolation*—Separation of the patient from nonimmune children and exclusion of the patient from school and public places for the period of presumed infectivity. (See 5.)

3. *Immunization*—None.

4. *Quarantine*—None. Exposed susceptible persons should be regularly inspected for the onset, the presence of initial symptoms of the disease, such as fever, or swelling or pain of the parotid or adjacent lymph glands, for three weeks from the date of last exposure.

5. *Concurrent disinfection*—All articles soiled with the discharges from the nose and throat of the patient.

6. *Terminal disinfection*—None.

(B) General measures—

None.

PARATYPHOID FEVER

1. INFECTIOUS AGENT. Paratyphoid bacillus A or B; *Salmonella paratyphi; Salmonella schottmulleri.*

2. SOURCE OF INFECTION. Bowel discharges and urine of infected persons, and foods contaminated with such discharges of infected persons or of healthy carriers. Healthy carriers may be numerous in an outbreak.

3. MODE OF TRANSMISSION. Directly by personal contact; indirectly by contact with articles freshly soiled with the discharges of infected persons or through milk, water, or food contaminated by such discharges.

4. INCUBATION PERIOD. Four to ten days; average, seven days.

5. PERIOD OF COMMUNICABILITY. From the appearance of prodromal symptoms, throughout the illness and relapses, during convalescence, and until repeated bacteriological examination of discharges show absence of the infecting organism.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by specific agglutination test, and by bacteriological examination of blood, bowel discharges, or urine.

2. *Isolation*—In fly-proof room, preferably under hospital conditions, of such cases as cannot command adequate sanitary environment and nursing care in their homes.

3. *Immunization* of exposed susceptibles.

4. *Quarantine*—None.

5. *Concurrent disinfection*—Disinfection of all bowel and urinary discharges and articles soiled with them.

6. *Terminal disinfection*—Cleaning.

(B) General measures—

1. Protection and purification of public water supplies.

2. Pasteurization of public milk supplies.

3. Supervision of other food supplies and of food handlers.[2]

4. Prevention of fly breeding.

5. Sanitary disposal of human excreta.

6. Extension of immunization by vaccination as far as practicable.

7. Supervision of paratyphoid carriers and their exclusion from the handling of foods.

8. Systematic examination of fecal specimens, from those who have been in contact with recognized cases, to detect carriers.

9. Exclusion of suspected milk supplies pending discovery of the personal or other cause of contamination of the milk.

10. Exclusion of water supply, if contaminated, until adequately treated with hypochlorite or other efficient disinfectant, or unless all water used for toilet, cooking, and drinking purposes is boiled before use.

[2] The human disease paratyphoid fever should not be confused with cases of food poisoning or infection due to enteritidis bacilli of animal origin.

PLAGUE

(Bubonic, Septicemic, Pneumonic)

1. INFECTIOUS AGENT. Plague bacillus; *Pasteurella pestis*.

2. SOURCE OF INFECTION. Blood of infected persons and animals, and sputum of human cases of plague pneumonia.

3. MODE OF TRANSMISSION. Direct, in the pneumonic form. In other forms the disease is generally transmitted by the bites of fleas (*Xenopsylla cheopis* and *Ceratophyllus fasciatus*), by which the disease is carried from rats to man, also by fleas from other rodents. Accidental, by inoculation, or by the bites of infected animals. Bedbugs may transmit the infection; flies may possibly convey the infection.

4. INCUBATION PERIOD. Commonly from three to seven days, although occasionally prolonged to eight or even fourteen days.

5. PEDIOD OF COMMUNICABILITY. Until convalescence is well established, period undetermined.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by bacteriological examination of blood, pus from glandular lesions, or sputum. Animal inoculation of material from suspected cases.

2. *Isolation*—Patient in hospital if practicable; if not, in a screened room which is free from vermin.[3]

3. *Immunization*—Active immunization of those who may be exposed.

4. *Quarantine*—Contacts for seven days.

5. *Concurrent disinfection*—All discharges and articles freshly soiled therewith.

6. *Terminal disinfection* — Thorough cleaning followed by thorough disinfection.

(B) General measures—

1. Extermination of rats and vermin by use of known methods for their destruction; destruction of rats on ships arriving from infected ports; examination of rats, ground squirrels, etc., in areas where the infection persists, for evidence of endemic or epidemic prevalence of the disease among them.

2. Supervision of autopsies of all deaths during epidemics.

3. Supervision of the disposal of the dead during epidemics, whether by burial, transfer, or holding in vault, whatever the cause of death.

4. Cremation, or burial in quicklime, of those dying of this disease.

[3] In plague pneumonia, personal prophylaxis, to avoid droplet infection must be carried out by persons who come in contact with the sick. Masks of closely woven cloth with mica windows should be worn over the head and to the shoulders. A long gown and rubber gloves drawn over the sleeves of the gown should be provided. These articles should not be removed from the sick room until disinfected.

PNEUMONIA

Acute Lobar

1. INFECTIOUS AGENT. Various pathogenic bacteria commonly found in the nose, throat, and mouth, such as the pneumococcus, the bacillus

of Friedlander, the influenza bacillus, etc.

2. SOURCE OF INFECTION. Discharges from the mouth and nose of apparently healthy carriers, as well as of recognized infected individuals, and articles freshly soiled with such discharges.

3. MODE OF TRANSMISSION. By direct contact with an infected person, or with articles freshly soiled with the discharges from the nose or throat of, and possibly from infected dust of rooms occupied by infected persons.

4. INCUBATION PERIOD. Short, usually two to three days.

5. PERIOD OF COMMUNICABILITY. Unknown; presumably until the mouth and nasal discharges no longer carry the infectious agent in an abundant amount or in a virulent form.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms. Specific infecting organisms may be determined by serological and bacteriological tests early in the course of the disease.

2. *Isolation* — Patient during clinical course of the disease.

3. *Immunization*—None; vaccines are worthy of further careful trial.

4. *Quarantine*—None.

5. *Concurrent disinfection*—Discharges from the nose and throat of the patient.

6. *Terminal disinfection* — Thorough cleaning, airing and sunning.

(B) General measures—

In institutions and camps, when practicable, people in large numbers should not be congregated closely within doors. The general resistance should be conserved by good feeding, fresh air, temperance in the use of alcoholic beverages, and other hygienic measures.

NOTE—The early reporting of pneumonia is highly desirable in view of its communicability.

POLIOMYELITIS

1. INFECTIOUS AGENT. A filterable virus of undetermined morphology.

2. SOURCE OF INFECTION. Nose, throat, and bowel discharges of infected persons or articles recently soiled therewith. Healthy carriers are supposed to be common.

3. MODE OF TRANSMISSION. By direct contact with an infected person or with a carrier of the virus, or indirectly by contact with articles freshly soiled with the nose, throat, or bowel discharges of such persons, and probably by drinking milk contaminated by the nose, mouth and bowel discharges of persons in the active stage of the disease.

4. INCUBATION PERIOD. Uncertain because of inexact information as to period of communicability and essentials for exposure, but believed to be from three to ten days, commonly six days.

5. PERIOD OF COMMUNICABILITY. Unknown; apparently not more than twenty-one days from the onset of disease, but may precede onset of clinical symptoms by several days.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, assisted by chemical and microscopical examination of the spinal fluid.

2. *Isolation* of all recognized cases for three weeks from febrile onset.

3. *Immunization*—None.

4. *Quarantine* of exposed children of the household and of adults of the household whose vocation brings them into contact with children, or who are food handlers, for fourteen days from last exposure to a recognized case.

5. *Concurrent disinfection*—Nose, throat, and bowel discharges and articles soiled therewith.

6. *Terminal disinfection*—Cleaning.

(B) General measures during epidemics—

1. Search for and examination of all sick children should be made.

2. All children with fever should be isolated pending diagnosis.

3. Education in such technique of bedside nursing as will prevent the distribution of infectious discharges to others from cases isolated at home.

RABIES

1. INFECTIOUS AGENT. Unknown.

2. SOURCE OF INFECTION. Saliva of infected animals, chiefly dogs.

3. MODE OF TRANSMISSION. Inoculation with saliva of infected animals through abrasion of skin or mucous membrane, almost always by bites or scratches.

4. INCUBATION PERIOD. Usually two to six weeks. May be prolonged to six months or even longer.

5. PERIOD OF COMMUNICABILITY—For fifteen days in the dog (not known in man) before the onset of clinical symptoms and throughout the clinical course of the disease.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by the presence of Negri bodies in the brain of an infected animal, or by animal inoculations with material from the brain of such infected animal.

2. *Isolation*—None if patient is under adequate medical supervision, and the immediate attendants are warned of possibility of inoculation by human virus.

3. *Immunization*—Preventive vaccination after exposure to infection by inoculation.

4. *Quarantine*—None.

5. *Concurrent disinfection* of saliva of patient and articles soiled therewith.

6. *Terminal disinfection* — Thorough cleaning.

(B) General measures—

1. Muzzling of dogs when on public streets, or in places to which the public has access.

2. Detention and examination of dogs suspected of having rabies.

3. Immediate antirabic treatment of people bitten by dogs or by other animals suspected or known to have rabies, unless the animal is proved not to be rabid by subsequent observation or by microscopic examination of the brain and cord.

4. Annual immunization of dogs where the disease is prevalent.

Rocky Mountain Spotted or Tick Fever

1. Infectious Agent. Unknown.

2. Source of Infection. Blood of infected animals, and infected ticks (dermacentor species).

3. Mode of Transmission. By bites of infected ticks.

4. Incubation Period. Three to ten days, usually seven days.

5. Period of Communicability. Has not been definitely determined, probably during the febrile stage of the disease.

6. Methods of Control:

(A) The infected individual and his environment—

1. *Recognition of the disease*—By clinical symptoms of the disease in areas where the disease is known to be endemic.

2. *Isolation*—None, other than care exercised to protect patients from tick bites when in endemic areas.

3. *Immunization*—The use of the Spencer-Parker vaccine in infected areas has given generally favorable results, but is still in the experimental stage.

4. *Quarantine*—None.

5. *Concurrent disinfection*—None. All ticks on the patient should be destroyed.

6. *Terminal disinfection*—None.

(B) General measures—

1. Personal prophylaxis of persons entering the infected zones during the season of ticks, by wearing tick-proof clothing, and careful daily search of the body for ticks which may have attached themselves.

2. The destruction of ticks by clearing and burning vegetation on the land in infected zones.

3. The destruction of ticks on domestic animals by dipping, and the pasturing of sheep on tick-infested areas where the disease is prevalent, with the object of diminishing the number of ticks.

4. The destruction of small mammalian hosts, as ground squirrels, chipmunks, etc.

Scarlet Fever

1. Infectious Agent. *Streptococcus scarlatinae.*

2. Source of Infection. Discharges from the nose, throat, ears, abscesses or wound surfaces, and articles freshly soiled therewith. The nose and throat discharges of carriers may also spread the disease.

3. Mode of Transmission. Directly by personal contact with an infected person; indirectly by articles freshly soiled with discharges of an infected person, or through contaminated milk, or milk products.

4. Incubation Period. Two to seven days, usually three or four days.

5. Period of Communicability. Three weeks from the onset of the disease, without regard to the stage or extent of desquamation, and only after all abnormal discharges have ceased and all open sores or wounds have healed.

6. Methods of Control:

(A) The infected individual and his environment—

1. *Recognition of the disease*—By clinical symptoms.

2. **Isolation — In home or hospital, maintained in each case until the end of the period of infectivity.** If medical inspection is not available, isolation for twenty-eight days from onset.

3. *Immunization*—Exposed susceptibles as determined by the Dick test may be actively immunized by scarlet fever toxin.

4. *Quarantine*—Exclusion of exposed children and teachers from school, and food handlers from their work, until seven days have elapsed since last exposure to a recognized case.

5. *Concurrent disinfection*—Of all articles which have been in contact with a patient and all articles soiled with discharges of the patient.

6. *Terminal disinfection* — Thorough cleaning.

(B) General measures—

1. Daily examination of exposed children and of other possibly exposed persons for a week after last exposure.

2. Schools should not be closed where daily observation of the children by a physician or nurse can be provided for.

3. In school and institutional outbreaks immunization of all exposed children with scarlet fever toxin may be advisable.

4. Education as to special danger of exposing young children to those exhibiting acute catarrhal symptoms of any kind.

5. Pasteurization of milk supply.

Septic Sore Throat

1. Infectious Agent. Streptococcus (hemolytic type).

2. SOURCE OF INFECTION. The human naso-pharynx, usually the tonsils, any case of acute streptococcus inflammation of these structures being a potential source of infection, including the period of convalescence of such cases. The udder of a cow infected by the milker is a common source of infection. In such udders the physical signs of mastitis may be absent.*

3. MODE OF TRANSMISSION. Direct or indirect human contact; consumption of raw milk contaminated by case or carrier or from an infected udder.

4. INCUBATION PERIOD. One to three days.

5. PERIOD OF COMMUNICABILITY. In man, presumably during the continuance of clinical symptoms; in the cow, during the continuance of discharge of the streptococci in the milk, the condition in the udder tending to a spontaneous subsidence. The carrier stage may follow convalescence and persist for some time.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms. Bacteriological examination of the lesions or discharges from the tonsils and naso-pharynx may be useful.

2. *Isolation*—During the clinical course of the disease and convalescence, and particularly exclusion of the patient from participation in the production or handling of milk or milk products.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection* — Articles soiled with discharges from the nose and throat of the patient.

6. *Terminal disinfection*—Cleaning.

(B) General measures—

1. Exclusion of suspected milk supply from public sale or use, until pasteurized. The exclusion of the milk of an infected cow or cows in small herds is possible when based on bacteriological examination of the milk of each cow, and preferably the milk from each quarter of the udder at frequent intervals. Exclusion of human cases or carriers from handling milk or milk products.

2. Pasteurization of all milk.

3. Education in the principles of personal hygiene and avoidance of the use of common towel, drinking and eating utensils.

* Mastitis in the cow, due to bovine streptococci, is not a cause of septic sore throat in humans unless a secondary infection of the udder by a human type of streptococcus takes place.

SMALLPOX

1. INFECTIOUS AGENT. Unknown.

2. SOURCE OF INFECTION. Lesions of the mucous membranes and skin of infected persons.

3. MODE OF TRANSMISSION. By direct personal contact; by articles soiled with discharges from lesions. The virus may be present in all body discharges, including feces and urine. It may be carried by flies.

4. INCUBATION PERIOD. Eight to sixteen days. (Cases with incubation period of twenty-one days are reported.)

5. PERIOD OF COMMUNICABILITY. From first symptoms to disappearance of all scabs and crusts.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms. Tests for immunity may prove useful.

2. *Isolation*—Hospital isolation in screened wards, free from vermin, until the period of infectivity is over.

3. *Immunization*—Vaccination.

4. Quarantine—Isolation of all contacts until vaccinated with virus of full potency. Daily medical observation of all recently vaccinated contacts until height of reaction is passed, if vaccination was performed within twenty-four hours of first exposure, otherwise for sixteen days from last exposure.

5. Concurrent disinfection of all discharges. No article to leave the surroundings of the patient without boiling or equally effective disinfections.

6. *Terminal disinfection* — Thorough cleaning and disinfection of premises.

(B) General measures—

General vaccination in infancy, revaccination of children on entering school, and of entire population when the disease appears in a severe form.

NOTE—In order to avoid possible complications or secondary and subsequent infections at the site of vaccination, it is important that the vaccination insertion be as small as practicable, not over one eighth inch in any direction, and that the site be kept dry and cool. The prick-pressure method as recommended by the United States Public Health Service, or the single scratch method is preferred. Primary vaccination between the ages of two and three months is particularly desirable. The time of vaccination should be adjusted to avoid skin lesions elsewhere on the body, in infants to avoid teething, and in older children to avoid the warmer months. Particular care should be used in primary vaccinations beyond the age of infancy.

SYPHILIS

1. INFECTIOUS AGENT. *Treponema pallidum.*

2. SOURCE OF INFECTION. Discharges from the lesions of the skin and mucous membranes, and the blood of infected persons, and articles freshly soiled with such discharges or blood in which the *Treponema pallidum* is present.

3. MODE OF TRANSMISSION. By direct personal contact with infected persons, and indirectly by contact with discharges from lesions or with the blood of such persons.

4. INCUBATION PERIOD. About three weeks. (In rare instances reported to have been as long as seventy days.)

5. PERIOD OF COMMUNICABILITY. As long as the lesions are open upon the skin, or mucous membranes at any stage of the disease.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by microscopical examination of discharges and by serum reactions.

2. *Isolation*—Exclusion from sexual contact and from preparation or serving of food during the early and active period of the disease; otherwise, none, unless the patient is unwilling to heed, or is incapable of observing, the precautions required by the medical advisor.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection* of discharges and of articles soiled therewith.

6. *Terminal disinfection*—None.

(B) General measures—

1. Education in matters of sexual hygiene, particularly as to the fact that continence in both sexes and at all ages is compatible with health and normal development.

2. Provision for accurate and early diagnosis and treatment, in hospitals and dispensaries, of infected persons, with consideration for privacy of record, and provision for following cases until cured.

3. Repression of prostitution by use of the police power and control of use of living premises.

4. Restriction of sale of alcoholic beverages.

5. Restriction of advertising of services or medicines for treatment of sex diseases, etc.

6. Abandonment of the use of common towels, cups, and toilet articles and eating utensils.

7. Exclusion of persons in the communicable stage of the disease from participation in the preparing and serving of food.

8. Personal prophylaxis should be advised to those who expose themselves to opportunity to infection.

TETANUS

1. INFECTIOUS AGENT. Tetanus bacillus; *Clostridium tetani*.

2. SOURCE OF INFECTION. Animal manure, soil, and street dust.

3. MODE OF TRANSMISSION. Inoculation, or wound infection.

4. INCUBATION PERIOD. Four days to three weeks, or longer, if latent bacilli deposited in the tissues are stirred to activity by subsequent chemical or mechanical irritation. Commonly eight to ten days.

5. PERIOD OF COMMUNICABILITY. Patient not infectious except in rare instances where wound discharges are infectious.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms; may be confirmed bacteriologically.

2. *Isolation*—None.

3. *Immunization*—By at least one, and preferably two, injections of antitoxin.

4. *Quarantine*—None.

5. *Concurrent disinfection*—None.

6. *Terminal disinfection*—None.

(B) General measures—

1. Supervision of the practice of obstetrics.

2. Educational propaganda such as "safety-first" campaign, and "safe and sane Fourth of July" campaign.

3. Prophylactic use of tetanus antitoxin where wounds have been acquired in regions where the soil is known to be heavily contaminated, and in all cases where wounds are ragged or penetrating.

4. Removal of all foreign matter as early as possible from all wounds.

5. Supervision of biological products, especially vaccines and sera.

TRACHOMA

1. INFECTIOUS AGENT. Undetermined.

2. SOURCE OF INFECTION. Secretions and purulent discharges from the conjunctivæ and adnexed mucous membranes of the infected persons.

3. MODE OF TRANSMISSION. By direct contact with infected persons and indirectly by contact with articles freshly soiled with the infective discharges of such persons.

4. INCUBATION PERIOD. Undetermined.

5. PERIOD OF COMMUNICABILITY. During the persistence of lesions of the conjunctivæ and of the adnexed mucous membranes or of discharges from such lesions.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms. Bacteriological examination of the conjunctival secretions and lesions may be useful.

2. *Isolation*—Exclusion of the patient from general school classes.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection* of discharges and articles soiled therewith.

6. *Terminal disinfection*—None.

(B) General measures—

1. Search for cases by examination of school children, of immigrants, and among the families and associates of recognized cases; in addition, search for acute secreting disease of conjunctivæ and adnexed mucous membranes, both among school children and in their families, and treatment of such cases until cured.

2. Elimination of common towels and toilet articles from public places.

3. Education in the principles of personal cleanliness and the necessity of avoiding direct or indirect transference of body discharges.

4. Control of public dispensaries where communicable eye diseases are treated.

TRICHINOSIS

1. INFECTIOUS AGENT. *Trichinella spiralis.*

2. SOURCE OF INFECTION. Uncooked or insufficiently cooked meat of infected hogs.

3. MODE OF TRANSMISSION. Consumption of undercooked infected pork products.

4. INCUBATION PERIOD. Variable; usually about one week.

5. PERIOD OF COMMUNICABILITY. Disease is not transmitted by human host.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by microscopical examination of muscle tissue containing trichinæ.

2. *Isolation*—None.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection* — Sanitary disposal of the feces of the patient.

6. *Terminal disinfection*—None.

(B) General measures—

1. Inspection of pork products for the detection of trichinosis.

2. Thorough cooking of all pork products at a temperature of 160° F. or over.

TUBERCULOSIS (PULMONARY)

1. INFECTIOUS AGENT. — Tubercle bacillus (human), *Mycobacterium tuberculosis (hominis).*

2. SOURCE OF INFECTION. The specific organism present in the discharges, or articles freshly soiled with the discharges from any open tuberculous lesions, the most important discharge being sputum. Of less importance are discharges from the intestinal and genito-urinary tracts, or from lesions of the lymphatic glands, bone, and skin.

3. MODE OF TRANSMISSION. Direct or indirect contact with an infected person by coughing, sneezing, or other droplet infection, kissing, common use of unsterilized food utensils, pipes, toys, drinking cups, etc., and possibly by contaminated flies and dust.

4. INCUBATION PERIOD. Variable and dependent upon the type of the disease.

5. PERIOD OF COMMUNICABILITY. Exists as long as the specific organism is eliminated by the host. Commences when a lesion becomes an open one—i. e., discharging tubercle bacilli, and continues until it heals or death occurs.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—By thorough physical examination supplemented by use of the X-ray and specific skin reactions when necessary and confirmed by bacteriological examinations of sputum or other materials.

2. *Isolation* of such "open" cases as do not observe the precautions necessary to prevent the spread of the disease.

3. *Immunization*—None.

4. *Quarantine*—None.

5. *Concurrent disinfection* of sputum and articles soiled with it. Particular attention should be paid to prompt disposal or disinfection of sputum itself, of handkerchiefs, cloths, or paper soiled therewith, and of eating utensils used by the patient.

6. *Terminal disinfection*—Cleaning and renovation.

(B) General measures

1. Education of the public in regard to the dangers of tuberculosis and the methods of control, with especial stress upon the danger of exposure and infection in early childhood.

2. Provision of dispensaries and visiting-nurse service for discovery of early cases and supervision of home cases.

3. Provision of hospitals for isolation of advanced cases, and sanatoria for the treatment of early cases.

4. Provision of open-air schools and preventoria for pretuberculous children.

5. Improvement of housing conditions and the nutrition of the poor.

6. Ventilation and elimination of dust in industrial establishments and places of public assembly.

7. Improvement of habits of personal hygiene and betterment of general living conditions.

8. Separation of babies from tuberculous mothers at birth.

TUBERCULOSIS (OTHER THAN PULMONARY)

1. INFECTIOUS AGENT. Tubercle bacillus (human and bovine), *Mycobacterium tuberculosis (hominis et bovis).*

2. SOURCE OF INFECTION. Discharges from mouth, nose, bowels, and genito-urinary tract of infected humans; articles freshly soiled with such discharges; milk from tuberculous cat-

tle; rarely the discharging lesion of bones, joints, and lymph nodes.

3. MODE OF TRANSMISSION. By direct contact with infected persons, by contaminated food, and possibly by contact with articles freshly soiled with the discharges of infected persons.

4. INCUBATION PERIOD. Unknown.

5. PERIOD OF COMMUNICABILITY. Until lesions are healed.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms confirmed by bacteriological and serological examinations.
2. *Isolation*—None.
3. *Immunization*—None.
4. *Quarantine*—None.
5. *Concurrent disinfection*—Discharges and articles freshly soiled with them.
6. *Terminal disinfection*—Cleaning.

(B) General measures—

1. Pasteurization of milk and inspection of meats.
2. Eradication of tuberculous cows from milch herds used in supplying raw milk.
3. Patients with open lesions should be prohibited from handling foods which are consumed raw.

TULARÆMIA

1. INFECTIOUS AGENT. *Bacterium tularense; Pasteurella tularensis.*

2. SOURCE OF INFECTION. Wild rabbits and ground squirrels; also infected laboratory animals—infected flies (*Chrysops discalis*) and ticks (*Dermacentor andersoni*).

3. MODE OF TRANSMISSION. By bites of infected flies and ticks and by inoculation through handling infected animals, as in dressing rabbits for market and cooking, or in performing necropsies on infected laboratory animals. Eye infections have been caused by contamination of the conjunctival sac with portions of the internal organs or with the body fluids of infected flies, ticks, and wild rabbits.

4. INCUBATION PERIOD. From twenty-four hours to nine days; average slightly more than three days.

5. PERIOD OF COMMUNICABILITY. There is no authentic record of transfer of the disease from man to man. The infection has been found in the blood during the first two weeks; in conjunctival scrappings and in lymph glands up to seventeen days; in the spleen taken at autopsy up to twenty-six days. Flies are infective for fourteen days, ticks throughout their lifetime. Refrigerated wild rabbits are infective for three weeks.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. Recognition of the disease. By clinical symptoms of the disease, by animal inoculation of infected material, and by agglutination reactions.
2. *Isolation*—None.
3. *Immunization*—None.
4. *Quarantine*—None.
5. *Concurrent disinfection*—Disinfection of discharges from the ulcer, lymph glands, or conjunctival sac.
6. *Terminal disinfection*—None.

(B) General measures—

1. Avoidance of the bites of, or handling of, flies and ticks when working in the infected zones during the seasonal incidence of the deer fly and tick.
2. The use of rubber gloves by persons engaged in dressing wild rabbits wherever taken, or when performing necropsies on infected laboratory animals. Employment of immune persons for dressing wild rabbits or conducting laboratory experiments. Thorough cooking of meat of wild rabbits.

TYPHOID FEVER

1. INFECTIOUS AGENT. Typhoid bacillus, *Eberthella typhi.*

2. SOURCE OF INFECTION. Bowel discharges and urine of infected individuals. Healthy carriers are common.

3. MODE OF TRANSMISSION. Conveyance of the specific organism by direct or indirect contact with a source of infection. Among indirect means of transmission are contaminated water, milk, and shellfish. Contaminated flies have been common means of transmission in epidemics.

4. INCUBATION PERIOD. From seven to twenty-three days, averaging ten to fourteen days.

5. PERIOD OF COMMUNICABILITY. From the appearance of prodromal symptoms, throughout the illness and relapses during convalescence, and until repeated bacteriological examinations of the discharges show persistent absence of the infecting organism.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by specific agglutination test and bacteriological examination of blood, bowel discharges, or urine.
2. *Isolation*—In fly-proof room, preferably under hospital conditions, of such cases as cannot command adequate sanitary environment and nursing care in their homes. Release from isolation should be determined by two successive negative cultures of stool and urine specimens collected not less than twenty-four hours apart.
3. *Immunization*—Of susceptibles in the family or household of the patient who have been exposed, or may be exposed during the course of the disease.

4. *Quarantine*—None.
5. Concurrent disinfection — Disinfection of all bowel and urinary discharges and articles soiled with them.
6. *Terminal disinfection*—Cleaning.

(B) General measures—

1. Protection and purification of public water supplies.
2. Pasteurization of public milk supplies.
3. Supervision of other food supplies, and of food handlers.
4. Prevention of fly breeding.
5. Sanitary disposal of human excreta.
6. Extension of immunization by vaccination as far as practicable in communities where the disease is prevalent.
7. Supervision of typhoid carriers and their exclusion from the handling of foods.
8. Systematic examination of fecal specimens from those who have been in contact with recognized cases, to detect carriers.
9. Persons who fail to show a strongly positive Widal reaction and contemplate traveling, should protect themselves by vaccination.
10. Exclusion of suspected milk supplies pending discovery of the person or other cause of contamination of the milk.
11. Exclusion of water supply, if contaminated, until adequately treated with hypochlorite or other efficient disinfectant, or unless all water used for toilet, cooking, and drinking purposes is boiled before use.

TYPHUS FEVER

1. INFECTIOUS AGENT. *Rickettsia prowazeki* is believed to be the causative agent.

2. SOURCE OF INFECTION. The blood of infected individuals.

3. MODE OF TRANSMISSION. Infectious agent transmitted by lice. (*Pediculus corporis, P. capitis.*)

4. INCUBATION PERIOD. Five to twenty days, usually twelve days.

5. PERIOD OF COMMUNICABILITY. Until thirty-six hours have elapsed after the temperature reaches normal.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms. Confirmation by agglutination tests ("Weil-Felix" reactions).
2. Isolation—In a vermin-free room. All attendants should wear vermin-proof clothing.
3. *Immunization*—Methods for immunization not generally accepted.
4. *Quarantine*—Exposed susceptible for fourteen days after last exposure.
5. *Concurrent disinfection*—None.
6. *Terminal disinfection* — Destroy all vermin and vermin eggs on body of patient, if not already accomplished. Destroy all vermin and eggs on clothing. Rooms to be rendered free from vermin.

(B) General measures—

Delousing of persons, clothing, and premises during epidemics, or when they have come or have been brought into an uninfected place from an infected community.

WHOOPING COUGH

1. INFECTIOUS AGENT. Pertussis bacillus of Bordet and Gengou, *Hemophilus pertussis*.

2. SOURCE OF INFECTION. Discharges from the laryngeal and bronichal mucous membranes of infected persons (rarely also of infected dogs and cats, which are known to be susceptible).

3. MODE OF TRANSMISSION. Contact with an infected person or animal or with articles freshly soiled with the discharges of such persons or animals.

4. INCUBATION PERIOD. Commonly seven days, almost uniformly within ten days.

5. PERIOD OF COMMUNICABILITY. Particularly communicable in the early catarrhal stages before the characteristic whoop makes a clinical diagnosis possible. The catarrhal stage occupies from seven to fourteen days. After the characteristic whoop has appeared the communicable period continues certainly for three weeks. Even if the spasmodic cough with whoop persists longer than this it is most unlikely that the infecting organism can be isolated from the discharges. The communicable stage must be considered to extend from seven days after exposure to an infected individual to three weeks after the development of the characteristic whoop.

6. METHOD OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, supported by a differential leukocyte count, and confirmed where possible by bacteriological examination of bronchial secretions. A positive diagnosis may be made by bacteriological examination of laryngeal discharges as early as one week before the development of the characteristic whoop.
2. Isolation—Separation of the patient from susceptible children, and exclusion of the patient from school and public places for the period of presumed infectivity.
3. *Immunization*—Use of prophylactic vaccination recommended by some observers. Not effective in all cases.
4. *Quarantine*—Limited to the exclusion of nonimmune children from school and public gatherings for ten days after their last exposure to a recognized case.
5. *Concurrent disinfection*—Discharges

tle; rarely the discharging lesion of bones, joints, and lymph nodes.

3. MODE OF TRANSMISSION. By direct contact with infected persons, by contaminated food, and possibly by contact with articles freshly soiled with the discharges of infected persons.

4. INCUBATION PERIOD. Unknown.

5. PERIOD OF COMMUNICABILITY. Until lesions are healed.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms confirmed by bacteriological and serological examinations.
2. *Isolation*—None.
3. *Immunization*—None.
4. *Quarantine*—None.
5. *Concurrent disinfection*—Discharges and articles freshly soiled with them.
6. *Terminal disinfection*—Cleaning.

(B) General measures—

1. Pasteurization of milk and inspection of meats.
2. Eradication of tuberculous cows from milch herds used in supplying raw milk.
3. Patients with open lesions should be prohibited from handling foods which are consumed raw.

TULARÆMIA

1. INFECTIOUS AGENT. *Bacterium tularense; Pasteurella tularensis.*

2. SOURCE OF INFECTION. Wild rabbits and ground squirrels; also infected laboratory animals—infected flies (*Chrysops discalis*) and ticks (*Dermacentor andersoni*).

3. MODE OF TRANSMISSION. By bites of infected flies and ticks and by inoculation through handling infected animals, as in dressing rabbits for market and cooking, or in performing necropsies on infected laboratory animals. Eye infections have been caused by contamination of the conjunctival sac with portions of the internal organs or with the body fluids of infected flies, ticks, and wild rabbits.

4. INCUBATION PERIOD. From twenty-four hours to nine days; average slightly more than three days.

5. PERIOD OF COMMUNICABILITY. There is no authentic record of transfer of the disease from man to man. The infection has been found in the blood during the first two weeks; in conjunctival scrappings and in lymph glands up to seventeen days; in the spleen taken at autopsy up to twenty-six days. Flies are infective for fourteen days, ticks throughout their lifetime. Refrigerated wild rabbits are infective for three weeks.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. Recognition of the disease. By clinical symptoms of the disease, by animal inoculation of infected material, and by agglutination reactions.
2. *Isolation*—None.
3. *Immunization*—None.
4. *Quarantine*—None.
5. *Concurrent disinfection*—Disinfection of discharges from the ulcer, lymph glands, or conjunctival sac.
6. *Terminal disinfection*—None.

(B) General measures—

1. Avoidance of the bites of, or handling of, flies and ticks when working in the infected zones during the seasonal incidence of the deer fly and tick.
2. The use of rubber gloves by persons engaged in dressing wild rabbits wherever taken, or when performing necropsies on infected laboratory animals. Employment of immune persons for dressing wild rabbits or conducting laboratory experiments. Thorough cooking of meat of wild rabbits.

TYPHOID FEVER

1. INFECTIOUS AGENT. Typhoid bacillus, *Eberthella typhi.*

2. SOURCE OF INFECTION. Bowel discharges and urine of infected individuals. Healthy carriers are common.

3. MODE OF TRANSMISSION. Conveyance of the specific organism by direct or indirect contact with a source of infection. Among indirect means of transmission are contaminated water, milk, and shellfish. Contaminated flies have been common means of transmission in epidemics.

4. INCUBATION PERIOD. From seven to twenty-three days, averaging ten to fourteen days.

5. PERIOD OF COMMUNICABILITY. From the appearance of prodromal symptoms, throughout the illness and relapses during convalescence, and until repeated bacteriological examinations of the discharges show persistent absence of the infecting organism.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, confirmed by specific agglutination test and bacteriological examination of blood, bowel discharges, or urine.
2. *Isolation*—In fly-proof room, preferably under hospital conditions, of such cases as cannot command adequate sanitary environment and nursing care in their homes. Release from isolation should be determined by two successive negative cultures of stool and urine specimens collected not less than twenty-four hours apart.
3. *Immunization*—Of susceptibles in the family or household of the patient who have been exposed, or may be exposed during the course of the disease.

4. *Quarantine*—None.
5. **Concurrent disinfection — Disinfection of all bowel and urinary discharges and articles soiled with them.**
6. *Terminal disinfection*—Cleaning.

(B) General measures—

1. **Protection and purification of public water supplies.**
2. **Pasteurization of public milk supplies.**
3. Supervision of other food supplies, and of food handlers.
4. Prevention of fly breeding.
5. Sanitary disposal of human excreta.
6. Extension of immunization by vaccination as far as practicable in communities where the disease is prevalent.
7. Supervision of typhoid carriers and their exclusion from the handling of foods.
8. Systematic examination of fecal specimens from those who have been in contact with recognized cases, to detect carriers.
9. Persons who fail to show a strongly positive Widal reaction and contemplate traveling, should protect themselves by vaccination.
10. Exclusion of suspected milk supplies pending discovery of the person or other cause of contamination of the milk.
11. Exclusion of water supply, if contaminated, until adequately treated with hypochlorite or other efficient disinfectant, or unless all water used for toilet, cooking, and drinking purposes is boiled before use.

TYPHUS FEVER

1. INFECTIOUS AGENT. *Rickettsia prowazeki* is believed to be the causative agent.

2. SOURCE OF INFECTION. The blood of infected individuals.

3. MODE OF TRANSMISSION. Infectious agent transmitted by lice. (*Pediculus corporis, P. capitis.*)

4. INCUBATION PERIOD. Five to twenty days, usually twelve days.

5. PERIOD OF COMMUNICABILITY. Until thirty-six hours have elapsed after the temperature reaches normal.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms. Confirmation by agglutination tests ("Weil-Felix" reactions).
2. **Isolation—In a vermin-free room. All attendants should wear vermin-proof clothing.**
3. *Immunization*—Methods for immunization not generally accepted.
4. *Quarantine*—Exposed susceptible for fourteen days after last exposure.
5. *Concurrent disinfection*—None.
6. *Terminal disinfection* — Destroy all vermin and vermin eggs on body of patient, if not already accomplished. Destroy all vermin and eggs on clothing. Rooms to be rendered free from vermin.

(B) General measures—

Delousing of persons, clothing, and premises during epidemics, or when they have come or have been brought into an uninfected place from an infected community.

WHOOPING COUGH

1. INFECTIOUS AGENT. Pertussis bacillus of Bordet and Gengou, *Hemophilus pertussis.*

2. SOURCE OF INFECTION. Discharges from the laryngeal and bronichal mucous membranes of infected persons (rarely also of infected dogs and cats, which are known to be susceptible).

3. MODE OF TRANSMISSION. Contact with an infected person or animal or with articles freshly soiled with the discharges of such persons or animals.

4. INCUBATION PERIOD. Commonly seven days, almost uniformly within ten days.

5. PERIOD OF COMMUNICABILITY. Particularly communicable in the early catarrhal stages before the characteristic whoop makes a clinical diagnosis possible. The catarrhal stage occupies from seven to fourteen days. After the characteristic whoop has appeared the communicable period continues certainly for three weeks. Even if the spasmodic cough with whoop persists longer than this it is most unlikely that the infecting organism can be isolated from the discharges. The communicable stage must be considered to extend from seven days after exposure to an infected individual to three weeks after the development of the characteristic whoop.

6. METHOD OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms, supported by a differential leukocyte count, and confirmed where possible by bacteriological examination of bronchial secretions. A positive diagnosis may be made by bacteriological examination of laryngeal discharges as early as one week before the development of the characteristic whoop.
2. **Isolation—Separation of the patient from susceptible children, and exclusion of the patient from school and public places for the period of presumed infectivity.**
3. *Immunization*—Use of prophylactic vaccination recommended by some observers. Not effective in all cases.
4. *Quarantine*—Limited to the exclusion of nonimmune children from school and public gatherings for ten days after their last exposure to a recognized case.
5. *Concurrent disinfection*—Discharges

from the nose and throat of the patient and articles soiled with such discharges.

6. *Terminal disinfection*—Cleaning of the premises used by the patient.

(B) General measures—

Education in habits of personal cleanliness and in the dangers of association or contact with those showing catarrhal symptoms with cough.

YELLOW FEVER

1. INFECTIOUS AGENT. Unknown.

2. SOURCE OF INFECTION. The blood of infected persons.

3. MODE OF TRANSMISSION. By the bite of infected *Aedes aegypti* mosquitoes.

4. INCUBATION PERIOD. Three to five days, occasionally six days.

5. PERIOD OF COMMUNICABILITY. First three days of the fever.

6. METHODS OF CONTROL:

(A) The infected individual and his environment—

1. *Recognition of the disease*—Clinical symptoms.

2. **Isolation—Isolate from mosquitoes in a special hospital ward or thoroughly screened room. If necessary the room or ward should be freed from mosquitoes by fumigation. Isolation necessary only for the first three days of the fever.**

3. *Immunization*—None.

4. *Quarantine*—Contacts for six days.

5. *Concurrent disinfection*—None.

6. *Terminal disinfection*—None. Upon termination of case the premises should be rendered free from mosquitoes by fumigation.

(B) General measures—

Eliminate mosquitoes by rendering breeding impossible.

(C) Epidemic measures—

1. Inspection service for the detection of those ill with the disease.

2. **Fumigation of houses in which cases of disease have occurred and of all adjacent houses.**

3. **Destruction of Aedes ægypti mosquitoes by fumigation; use of larvicides; eradication of breeding places.**

AMERICAN PUBLIC HEALTH ASSOCIATION

LIST OF MEMBERS

MAY FIRST
1927

LIST OF MEMBERS
AMERICAN PUBLIC HEALTH ASSOCIATION

MAY 1, 1927

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* Indicates Fellows.
† Indicates Associate Members.
No symbol Indicates Active Members.
†† Indicates Sustaining Members.
‡ Indicates Affiliated State Public Health Societies.

The Section affiliations of Fellows are indicated as follows:
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(*O*) Public Health Administration Section.
(*E*) Sanitary Engineering Section.
(*V*) Vital Statistics Section.
(*I*) Industrial Hygiene Section.
(*F*) Food and Drugs Section.
(*C*) Child Hygiene Section.
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